

# CENTERVILLE CITY PLANNING COMMISSION AGENDA

NOTICE IS HEREBY GIVEN THAT THE CENTERVILLE CITY PLANNING COMMISSION WILL HOLD ITS REGULAR PUBLIC MEETING AT 7:00 P.M. ON WEDNESDAY, JULY 22, 2015, AT THE CENTERVILLE CITY COMMUNITY CENTER AND CITY HALL COUNCIL CHAMBERS, 250 NORTH MAIN STREET, CENTERVILLE, UTAH. THE AGENDA IS SHOWN BELOW.

*Meetings of the City Council of Centerville City may be conducted via electronic means pursuant to Utah Code Ann. § 52-4-207, as amended. In such circumstances, contact will be established and maintained via electronic means and the meeting will be conducted pursuant to the Electronic Meetings Policy established by the City Council for electronic meetings.*

*Centerville City, in compliance with the Americans with Disabilities Act, provides accommodations and auxiliary communicative aids and services for all those citizens in need of assistance, including hearing devices. Persons requesting these accommodations for City-sponsored public meetings, services, programs, or events should call Blaine Lutz, Centerville Finance Director, at 801-295-3477, giving at least 24 hours notice prior to the meeting.*

A notebook containing supporting materials for the business agenda items is available for public inspection and review at City Hall and will be available for review at the meeting. This agenda is also posted on the City's Website: [www.centervilleut.net](http://www.centervilleut.net) and on NovusAgenda at the following link: <http://centerville.novusagenda.com/agendapublic>

**Tentative Time:** (The times shown below are tentative and are subject to change during the meeting)

- 7:00    A.    WELCOME AND ROLL CALL  
         B.    PLEDGE OF ALLEGIANCE  
         C.    PRAYER OR THOUGHT – Commissioner William Ince  
         D.    MINUTES REVIEW AND ACCEPTANCE – July 8, 2015  
         E.    COMMISSION BUSINESS
- 7:10        1.    PUBLIC HEARING | YOUNGBLOOD EQUIPMENT/STORAGE YARD AT THE  
                 CORNER OF 650 NORTH 1250 WEST  
                 Consider proposed Conceptual Site Plan on property located at approximately 650 North 1250  
                 West, for the purpose of an equipment/storage yard. Donald Youngblood, Property Owner &  
                 Applicant
- 7:25        2.    PUBLIC HEARING | PORTER LANE TOWNHOMES | 564 WEST PORTER LN  
                 Consider the following proposed applications:  
                 1.    Postponed from June 24, 2015 Meeting, Conditional Use Permit to allow the density  
                 of 8 units per acre in the R-M Zone  
                 2.    Final Site Plan for the Porter Lane Townhomes, on property located at 564 West Porter  
                 Lane (400 South). The project includes a 46-unit townhome community, and 1 existing  
                 single-family dwelling  
                 Taylor Spendlove, Brighton Development Utah, LLC, Applicant
- 8:00        3.    COMMUNITY DEVELOPMENT DIRECTOR'S REPORT  
                 a.    Upcoming Meetings  
                 •    PC Meeting August 12, 2015: No items scheduled at  
                 this time
- 8:05    F.    ADJOURNMENT

Posted July 17, 2015 by Community Development



# ***PRELIMINARY DRAFT***

## **PLANNING COMMISSION MINUTES OF MEETING**

**Wednesday, July 8, 2015**

**7:00 p.m.**

A quorum being present at Centerville City Hall, 250 North Main Street, Centerville, Utah. The meeting of the Centerville City Planning Commission was called to order at 7:00 p.m.

### **MEMBERS PRESENT**

Cheylynn Hayman

David Hirschi, Chair

Gina Hirst

William Ince

Logan Johnson

Kevin Merrill

### **MEMBERS ABSENT**

Scott Kjar

### **COUNCIL MEMBERS PRESENT**

Paul Cutler, Mayor

Ken Averett

Tamilyn Fillmore

Stephanie Ivie

John Higginson

### **COUNCIL MEMBERS ABSENT**

Lawrence Wright

### **STAFF PRESENT**

Corvin Snyder, Community Development Director

Lisa Romney, City Attorney

Kathy Streadbeck, Recording Secretary

### **VISITORS**

Interested citizens

### **PLEDGE OF ALLEGIANCE**

### **OPENING COMMENT/LEGISLATIVE PRAYER**

Commissioner Hayman

**MINUTES REVIEW AND APPROVAL**

The minutes of the Planning Commission meeting held June 24, 2015 were reviewed and amended. Commissioner Hirst made a **motion** to approve the minutes as amended. The motion was seconded by Commissioner Hayman and passed by unanimous vote (6-0).

**PUBLIC HEARING | TRUMP RESIDENTIAL LOT | 540 SOUTH 400 WEST -  
Consider proposed Final Site Plan for an unplatted residential building lot on property  
located at 540 South 400 West, for the purpose of constructing a new dwelling. Scott &  
Susan Trump, Applicants.**

Cory Snyder, Community Development Director, reported the Planning Commission previously accepted the conceptual site plan for the proposed single family home. The applicant has addressed the conditions of approval from the conceptual acceptance and is now ready for a final site plan review. The applicant will still be required to pay all applicable fees, submit all necessary utility provider sheets, and receive final approvals from the City Engineer. In addition, a current title report will still need to be submitted to the City Attorney for review. Overall, the final site plan is in harmony with the previously approved conceptual site plan. A building permit is required prior to any construction taking place and will need to meet all applicable standards found within the Zoning Ordinance.

Chair Hirschi opened the public hearing. Seeing no one wishing to comment; he closed the public hearing.

Commissioner Hirst questioned if all utilities are available to this site and if any connections will need to be adjusted. Mr. Snyder said all utilities are available to the site and staff will ensure all connections are appropriate during the building permit process. He said all utility companies have been contacted; the applicant is awaiting responses.

Scott Trump, applicant, reviewed the site plan explaining its unique layout. The hammerhead driveway will ensure fire safety access and turn-around. He also explained his hopes to utilize this property for some small farming activities, including small animals.

Chair Hirschi made a **motion** for the Planning Commission to approve the final site plan for the Scott and Susan Trump Residential Lot, located at 540 South 400 West, with the following conditions:

***Conditions:***

1. All professional service fees, development fees and related impact fees shall be paid.
2. A bond for all public improvements must be posted prior to the issuance of a building permit.

3. The submitted grading and utility plan shall be reviewed and approved by the City Engineer prior to a building permit being issued.
4. Applicant shall provide appropriate public utility easements and submit to the City. All easements shall be accepted by the City Council and recorded with the Davis County Recorder's Office.
5. A current title report shall be submitted to the City Attorney for review prior to issuance of a building permit.

***Reasons for Action (findings):***

1. The applicant has clearly shown how the property may be developed [Section 12-21-110(d)(2)].
2. The applicant has submitted a full final site plan application [Section 12-21-110(e)(2)].
3. Proposed utility easements are required on all developed lots [Section 12-21-110(e)(2)(iii)(d), 15-5-106(8)].

The motion was seconded by Commissioner Merrill and passed by unanimous roll-call vote (6-0).

**WORK SESSION | SOUTH MAIN STREET CORRIDOR PLAN & PUBLIC COMMENTS REVIEW - The City Council and the Planning Commission will discuss the South Main Street Corridor Plan and review all the public comments received from various meetings.**

The Planning Commission and City Council reviewed and discussed several aspects of the South Main Street Corridor Plan (SMSC), including the many public comments that have been made over the past several meetings. Mayor Cutler explained the City Council recently reviewed the proposed density cap as recommended by the Planning Commission and after a lengthy discussion the issue was ultimately tabled for further review and discussion. In addition to density caps the Commission and Council also discussed viability, mixed-uses, building heights and framing, and public spaces.

City staff reviewed conditional use permits and how this tool is used to allow additional development options if negative impacts are appropriately mitigated. Staff also reviewed the Planned Development Overlay (PDO) tool, which also provides an option for additional density but also ensures an overall better developed project. Staff explained there may be some ways to take a more conservative approach to density including a density cap. Several Council and Commission members agreed each tool can be useful but that each tool also presents its own challenges with respect to the SMSC. A majority of the members present agreed a density cap is an appropriate safeguard for the SMSC.

1 Chair Hirschi said density and viability go hand in hand; the viability of commercial uses  
2 depends on residential roof tops. He said if residential density is too restricted then commercial  
3 uses will struggle. He said residential density should promote both commercial and retail uses.  
4 He said commercial is important and should be encouraged along Main Street in addition to  
5 appropriate residential uses. He said there have been many comments made that residential only  
6 is the way to go. He is not sure this is best for Main Street. He said single-family uses are more  
7 difficult to control. He questioned if the city really wants single-family homes with yards and  
8 structures that cannot be specifically regulated along Main Street. He also questioned if people  
9 would really be interested in raising a family on a busy Main Street. He believes the mixed-use  
10 concept is still the best option for Main Street. He said he is also concerned with the idea of a  
11 single-family PDO on Main Street. He said this could potentially put a fence along Main Street  
12 with single-family homes facing interior. He does not believe a "wall" on Main Street is a good  
13 idea. He is also concerned with "down zoning" Main Street from commercial to residential only.  
14 He said this is unfair to current property owners who have been paying commercial taxes for  
15 many years.

16  
17 Councilwoman Fillmore said the SMSC uses form base standards to help unify  
18 development along the frontage of Main Street, but does not address the rear parcels very well;  
19 perhaps some clarification may be appropriate for rear residential uses. She believes the mixed-  
20 use concept is still the best option for Main Street. She said economic viability is very important.  
21 There needs to be enough return so a property owner is able to demolish an old building and  
22 build a new high quality project. However, she is concerned comments made regarding viability  
23 may be just that, comments. She believes viability needs to be studied more thoroughly to know  
24 for sure if this is an issue. She said the mixed-use concept allows people to live and work in  
25 Centerville. She said the SMSC is appropriate because it provides flexibility. She said current  
26 property owners have expressed a desire for flexibility so they can find the best redevelopment  
27 option for their situation. She said Main Street is intended to be primarily commercial. She  
28 suggested keeping commercial as the primary use and residential or mixed-use as secondary. She  
29 is concerned a density cap could be detrimental for smaller properties and may hinder their  
30 ability to redevelop. She believes a required commercial use or mixed-use will help control  
31 density. She said the majority of the comments made in the past few meetings have been concern  
32 over density, not necessarily negatives toward the SMSC plan. She believes eliminating  
33 commercial on Main Street will intensify residential uses and density. She said a density cap may  
34 be appropriate but is worried that if set to low could encourage blight because there is no  
35 incentive for redevelopment. She believes it is important to maintain the synergy of the SMSC  
36 and encourage consistent redevelopment.

37  
38 Commissioner Merrill said single-family lots are not as sought after with rising  
39 generations. Research has shown that generations to come prefer smaller mixed-use homes with  
40 little to no maintenance and services within walking distance.

1 Mayor Cutler said flexibility is important and questioned if there is a need to promote  
2 townhomes or other forms of multi-family housing on Main Street. Commissioner Johnson said  
3 he likes the flexibility of either residential, commercial, or mixed-use. Commissioner Hayman  
4 agreed flexibility is best, but does not believe residential only is the best or viable option. She  
5 said townhomes could be appropriate with a suitable density cap and green space requirement.  
6 She questioned if a lower density cap could be set with incentivized increases? She too is  
7 concerned with blight, but also wants to find a balance in keeping Centerville's unique small  
8 town feel.

9  
10 City staff discussed possible density caps (i.e., 4, 6, and 8). Staff believes there are pros  
11 and cons to each density cap option. Staff is willing to research possible incentive options and  
12 tools. Staff also discussed the General Plan for Main Street explaining some changes to the  
13 SMSC may also require a change to the General Plan. Staff explained it may be possible to cap  
14 residential densities and/or size of parcel with some type of tiered density system. Staff  
15 explained that a density cap will affect viability and the City needs to be careful not to negatively  
16 impact property owners. Staff agreed the higher the density cap the more likely it will not  
17 negatively affect smaller parcels.

18  
19 Councilman Higginson agreed commercial uses should be encouraged along Main Street.  
20 He said commercial uses should front Main Street with residential uses behind. He is not  
21 concerned with catering to every demographic. He said Centerville is different and unique. He  
22 said walkability is often discussed but is rarely a reality. He said there are walkable  
23 developments but most people drive to them, then walk around. He said Main Street will not  
24 likely ever become a true walkable area. He said he is in favor of a density cap and is also in  
25 favor of keeping commercial uses on Main Street.

26  
27 Councilman Averett questioned if the City is planning for the past or planning for the  
28 future. He said retail is not viable on Main Street mostly due, he believes, to online sales. He said  
29 current research shows that 1 in 5 Americans work from home at least once a week and trends  
30 show that number will only increase in the future. He agrees live/work concepts are important  
31 and should be encouraged. He agreed future generations want to live in smaller PDO type  
32 developments with no maintenance. He said it seems the future is leaning toward mixed-use  
33 options.

34  
35 The Planning Commission and City Council discussed density with regard to the Pages  
36 Lane area which is set at a much higher density. Members present were not as concerned with  
37 this area as it is different from the Core District and will bring a different type of redevelopment.  
38 A majority of the members present agreed the Pages Lane area may still require a density cap but  
39 at a much higher option in order to maintain flexible redevelopment options. The Planning  
40 Commission agreed to research and discuss the Pages Lane area and provide a recommendation  
41 for density to the City Council in the near future.

Councilwoman Ivie said she is not comfortable with any density over four (4) units per acre along Main Street including the Pages Lane area. She said Centerville already has over 600 units within this small SMSC area, which is too dense. She said any additional density will only negatively impact the area.

City staff discussed public open space options along Main Street, including sidewalk, trees, street furniture, parking and lighting. Staff explained how UDOT is involved with these decisions as Main Street is a State owned road. The City intends to complete a public space plan for Main Street in the future. The public right-of-way is narrow and options are limited. Any public space plan will require feasibility studies and coordination with UDOT. The Commission and Council discussed requiring aesthetic public space improvements as part of redevelopment plans thus placing the burden on property owners. Staff reminded those present that these types of burdens are generally balanced with density increases. Chair Hirschi suggested creating a PDO option for Main Street with bonus density provisions for public space improvements. This possible PDO option could also maintain the SMSC building structure/framing and commercial use requirements. The Planning Commission agreed to research and discuss possible public space options in the near future.

The Commission and Council discussed building heights for Main Street. The building height for all residential homes across the city is 35 feet. A majority of the members present agreed a maximum building height of 35 feet is appropriate for Main Street and will help encourage redevelopment. It was also mentioned that building height can be mitigated with setbacks. City staff discussed the "framing" concept. If buildings are brought forward then parking is pushed behind providing less vehicular accesses on Main Street and a buffer between the commercial fronts and residential uses behind. It was mentioned that "framing" should provide more commercial viability because the cost from UDOT to install an access on Main Street is excessive.

The Commission and Council discussed street width. Concerns were raised regarding the challenges that sub-standard street widths can produce (i.e., maintenance, fire access, density, parking, etc.). City staff debated the challenges that can come when full-width streets are required in private developments (i.e., parking lots, car ports, decreased circulation, speed, etc.) Staff agreed to research possible options to increase street widths where possible.

#### **COMMUNITY DEVELOPMENT DIRECTOR'S REPORT**

1. The next Planning Commission meeting will be Wednesday, July 22, 2015.
2. Upcoming Agenda Items
  - Porter Lane Townhomes, Conditional Use Permit & Final Site Plan
  - Youngblood Storage, Conceptual Site Plan

The meeting was adjourned at 9:45 p.m.

\_\_\_\_\_  
David Hirschi, Chair

\_\_\_\_\_  
Date Approved

\_\_\_\_\_  
Kathleen Streadbeck, Recording Secretary

**CENTERVILLE CITY  
COMMUNITY DEVELOPMENT DEPARTMENT  
655 North 1250 West, Centerville, Utah 84014  
(801) 292-8232**

**STAFF REPORT  
AGENDA: ITEM 1**

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**PROPERTY OWNER/  
APPLICANT:** DONALD YOUNGBLOOD  
905 NORTH OAKRIDGE DRIVE  
FARMINGTON, UT 84025

**PROPERTY:** 1250 WEST 650 NORTH  
LOT 8, H&H COMMERCIAL PARK

**ACREAGE:** .9 ACRES

**ZONING:** INDUSTRIAL-HIGH (I-H)

**APPLICATION:** CONCEPTUAL SITE PLAN ACCEPTANCE FOR  
YOUNGBLOOD OUTDOOR STORAGE

**USE:** OUTDOOR STORAGE

**RECOMMENDATION:** ACCEPT THE CONCEPTUAL SITE PLAN

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**BACKGROUND**

Mr. Youngblood's property located on the corner of 650 North 1250 West has been the location of an ongoing enforcement concerning utilizing the property without proper approval. Mr. Youngblood has been utilizing the property for the storage of vehicles and storage containers filled with equipment and vehicles for racing. However, the land being utilized has never gone through City approval for a specified use and approved site plan. Since Mr. Youngblood needs the property for his equipment, he desires to receive approval from the Planning Commission. The property is located on Lot 8 of the H&H Commercial Park and is just west of Mr. Youngblood's approved industrial building.

**CONCEPTUAL SITE PLAN REVIEW, SECTION 12-12-110(d)**

**Table of Uses Allowed - Chapter 12-36**

Within the Zoning Ordinance, the Table of Uses does not specifically call out outside storage. It does however prohibit the use of automobile wrecking yards and a junk and salvage yard. The property may *not* be used for these purposes and if they are found to be in violation of the Zoning Ordinance, they will be subject to enforcement action. Since the proposed use is not specifically called out, Mr. Youngblood will need to secure a primary use prior to receiving approval for a

final site plan. To accomplish this, a “use” interpretation must be requested by the Zoning Administrator for approval of a designated use for the site [Section 12-21-090]. Another option is for the applicant to submit a Zone Text Amendment Application in order to call out the specific use within the code. Since Mr. Youngblood will be limited to very specific uses on the site, staff is requesting he submit specifics of what will be stored on site as part of the “use” interpretation.

**Table 12-35-1**

According to Table 12-35-1 of the Zoning Ordinance, the use of outdoor storage is a permitted use within the Industrial-High and Industrial-Very High zones. Therefore, the request of Mr. Youngblood would be a permitted use as long as it meets all other requirements pertaining to landscaping and screening.

**General Plan - Section 12-480-6**

The Centerville City General Plan indicates the area of development is within the West Centerville Neighborhood and the Centerville City Business Park District. The goal for the area is “...to maintain and eventually upgrade the conditions and appearance of the buildings and yard areas, while being sensitive to the needs of existing business and property owners” (Section 12-480-6(1)). In addition, the objectives encourage the economic viability, and the enhancement of architectural standards and themes for businesses located within the business park. The applicant will be upgrading the lot from a vacant parcel of weeds to a storage area with landscaping and screening. Eventually, Mr. Youngblood desires to construct a building on the vacant lot, yet at this time, is not ready to proceed with this idea. However, it does appear the proposed storage area will meet the goals and objectives of the General Plan.

**Development Standards**

The site location is 0.9 of an acre, with the majority of the property being covered with gravel, and screened by a chain link fence with vinyl slats. The exterior of the property, adjacent to the street, will be landscaped with shrubs, trees and decorative boulders. Since no building is being constructed at this time, the Development Standards found in Section 12-35-1 of the Zoning Ordinance would not apply.

**Landscaping - Chapter 12-51**

The submitted plans indicate that 8,460 square feet will be designated in landscaping. However, these plans are unclear on how much of this is found on site. According to Section 12-51-070(d)(1) of the Zoning Ordinance, at least 10% of a development outside of the public right-of-way must be landscaped. As a reminder, 75% of the landscaping must be live material. Mr. Youngblood will need to clarify this amount and ensure the required percentage has been completed. Since no building or parking lot are being constructed, these landscaping requirements are not required at this time. A finalized landscape plan will need to be submitted with the final site plan.

| <b>Required Landscaping Summary Chapter 12-51</b> |                 |                               |                          |
|---------------------------------------------------|-----------------|-------------------------------|--------------------------|
| <b>Guidelines</b>                                 | <b>Standard</b> | <b>Required Site Specific</b> | <b>Actual/Compliance</b> |
| Total Area Landscaping                            | 10%             | 4,340 square feet             | Not Defined              |

|                           |                                                           |                          |   |
|---------------------------|-----------------------------------------------------------|--------------------------|---|
| Total Required Trees      | 1 Tree per 500 square feet of <i>required</i> landscaping | 7 Required               |   |
| Trees for Street Frontage | 1 per 25 linear feet                                      | 17 Required Based on 417 | 7 |

**Screening – Section 12-51-110**

Within Section 12-51-110(b) of the Zoning Ordinance, an approved storage area must be screened from view by a non-opaque fence. This fence may be powder coated or vinyl coated chain link with vinyl slats. Mr. Youngblood stated that he is looking to follow the same design as the LDS Church property to the south, which has a powder coated chain link fence with slats. Detail concerning the screening has been indicated on the site plan and meets the requirements of the Ordinance.

**Conclusion**

Since Mr. Youngblood desires to construct a future building, he has designed his lot accordingly. He has placed his drive approaches and storm drainage in locations that would also work for future development. The storm drainage will need to be verified with the City Engineer to ensure all City Standards will be satisfied. A bond will also need to be posted for any improvements in the public right-of-way, prior to any construction taking place.

**PLANNING STAFF RECOMMENDATION**

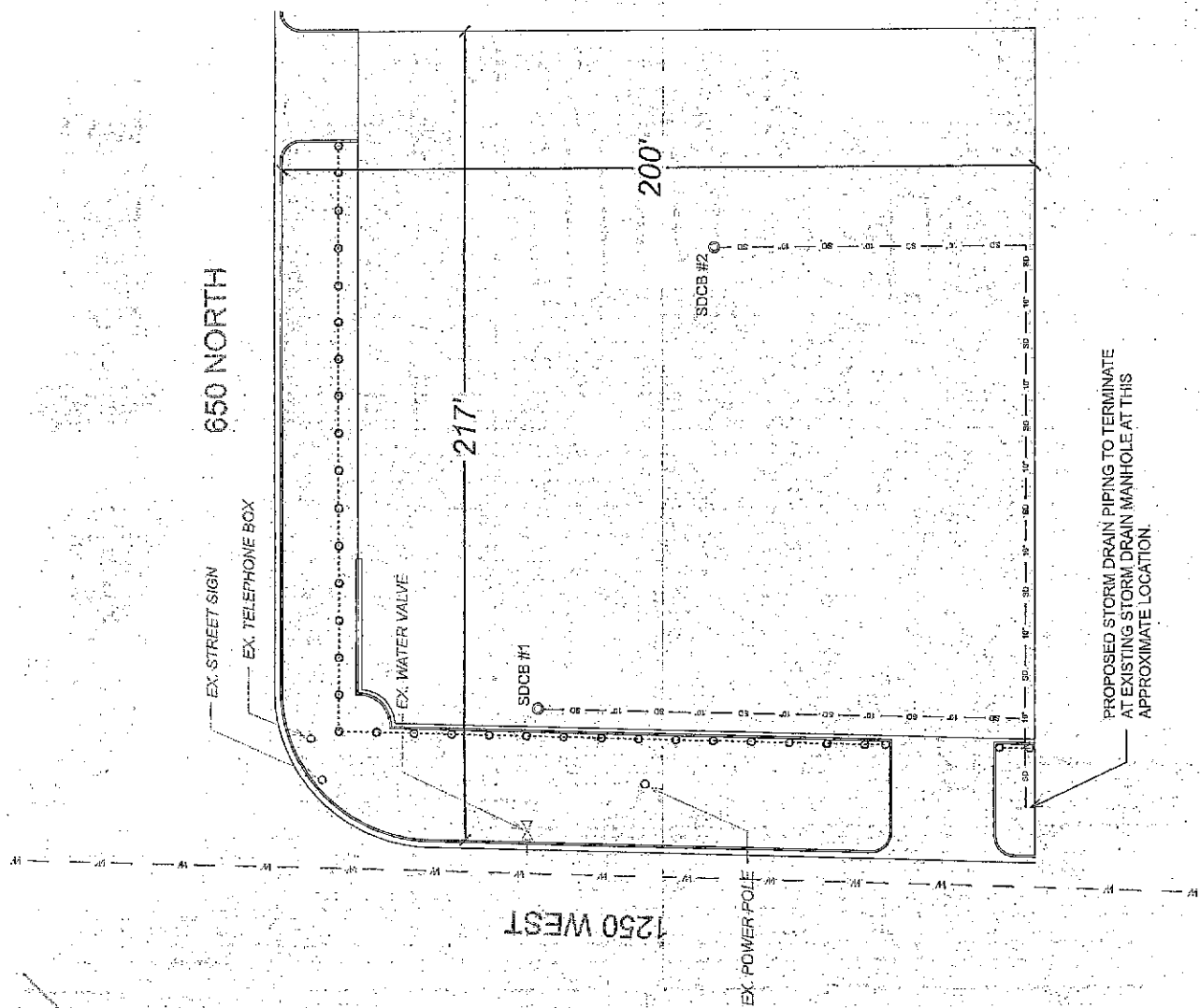
**PROPOSED ACTION:** I hereby make a motion for the Planning Commission to accept the conceptual site plan for the Youngblood Outdoor Storage, to be located at 650 North 1250 West, with the following conditions:

1. The outdoor storage shall be utilized by Mr. Youngblood for the use of storage containers and working vehicles. The lot shall not be used as a junk and salvage yard, wrecking yard or a public storage facility.
2. A permitted use review or a Zoning Code Amendment shall be pursued by the applicant to establish a primary use on site, prior to receiving final site plan approval. Specific items to be stored on site shall be submitted as part of the “use” interpretation.
3. The applicant shall submit a Final Site Plan application meeting the standards found in Section 12-21-110(e) of the Zoning Ordinance.
4. A revised landscaping plan shall be submitted showing 10% of the property in landscaping and meeting all required tree counts.
5. A bond shall be posted for all landscaping improvements located along 650 North and 1250 West.
6. The storage area shall be completely screened from view with an opaque fence or wall.
7. The driveway leading into the storage area shall be constructed with concrete and meeting all City Standards. The City Engineer has stated that this shall be assessed prior to any development taking place.
8. Mr. Youngblood shall address the surfacing improvements within the storage area with a material that is acceptable to the Public Works Director and the City Engineer.
9. If the applicant fails to improve the land and abide by the conditions set forth, enforcement procedures concerning the unapproved storage will commence.

10. All storm drainage shall be properly addressed to meet all City Standards and shall be approved by the City Engineer.

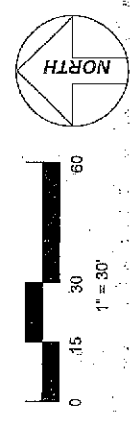
**SUGGESTED REASONS FOR THE ACTION:**

1. The conceptual site plan submittal has adequately shown how the property may be developed [Section 12-21-110(d)(2)].
2. According to Table 12-35-1, outside storage is a permitted use as long as it meets all screening standards found in Section 12-51-110(b) of the Zoning Ordinance.
3. All required landscaping must be found on site [Section 12-51-070(d)(1)]
4. Applicable Development Standards for the I-H Zone have been reviewed [Chapter 12-35].



**SITE TABULATIONS**  
 OVERALL SITE AREA = .996 acre / 43,400 sqft / 200' W x 217' L  
 PLANNED LANDSCAPE AREA = 8460 sqft  
 PARKING STALLS = 27

- PROPOSED CHAIN LINK FENCE WITH VINYL SLAT INSERTS. (ONE POST EVERY 10')
- PROPOSED 10" SDR-35 PVC DRAINAGE LINES.
- PROPOSED NYLOPLAST STORM DRAIN CATCH BASIN.



RECEIVED JUN 24 2015

SHEET DESCRIPTION:  
 SITE / UTILITY PLAN

PROJECT:  
 YOUNGBLOOD PROPERTY  
 HIGH COMMERCIAL PARKLOT #8  
 CENTERVILLE, UT 84014

REVISIONS:  
 None

DATE:  
 5/25/2015

JOB NUMBER:

DRAWN BY:  
 MCS

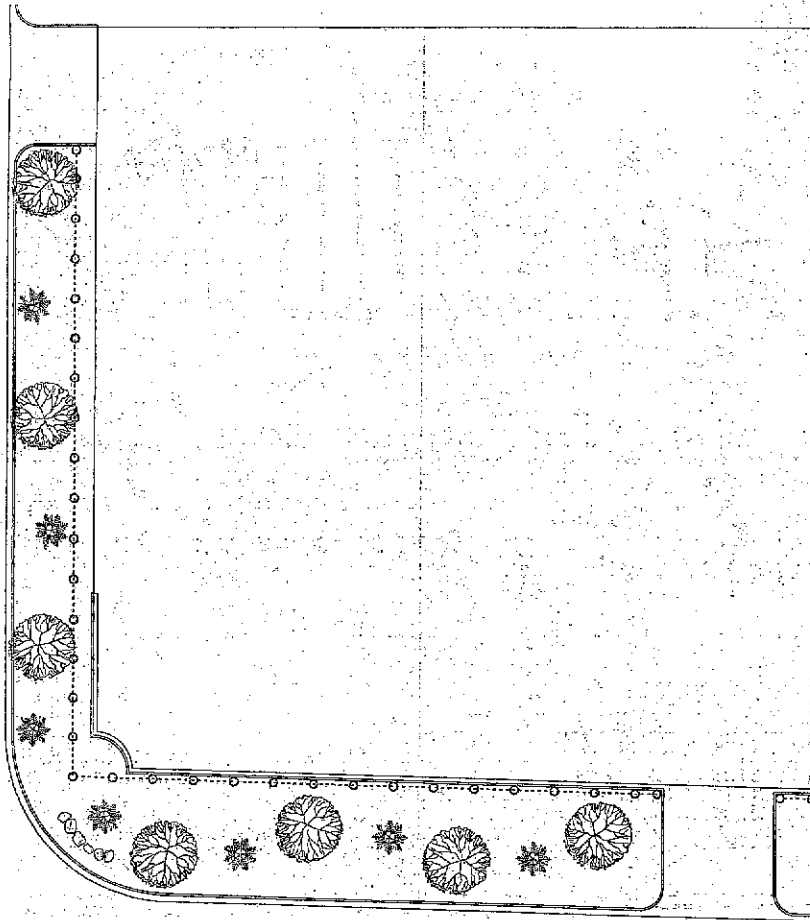
CHECKED BY:  
 MCS

SCALE:  
 1" = 30'

SHEET:  
 1 of 3

650 NORTH

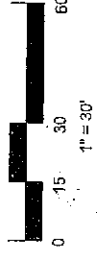
1250 WEST



**Landscape**

| Quantity | Symbol | Description                                              |
|----------|--------|----------------------------------------------------------|
| 7        |        | 'Prince of Wales' Juniper, Juniperus Horizontalis 2gal   |
| 7        |        | 'Shademaster' Honey Locust, Gleditsia Triacanthos 1-2gal |
|          |        | Decorative Boulders                                      |
|          |        | Rock Mulch 3/4" minus over 5oz Landscape Fabric          |

\* ALL OPEN AREA TO BE COVERED WITH 3/4" MINUS GRAVEL



SHEET DESCRIPTION:  
LANDSCAPE PLAN

PROJECT:  
H&H COMMERCIAL PARK LOT #8  
CENTERVILLE, UT 84014

REVISIONS:  
None

DATE:  
5/25/2015

JOB NUMBER:

DRAWN BY:  
MCS

CHECKED BY:  
MCS

SCALE:  
1" = 30'

SHEET:  
2 of 3

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**CENTERVILLE CITY  
COMMUNITY DEVELOPMENT DEPARTMENT  
655 North 1250 West, Centerville, Utah 84014  
(801) 292-8232**

**STAFF REPORT  
AGENDA: ITEM 2**

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**PROPERTY OWNER:**     **ATIELI & MONALISA HAFOKA  
564 WEST PORTER LANE  
CENTERVILLE CITY, UT 84014**

**APPLICANT:**           **TAYLOR SPENDLOVE  
BRIGHTON DEVELOPMENT LLC  
215 NORTH REDWOOD ROAD #8  
NORTH SALT LAKE CITY, UT 84054  
([taylor@brightonhomesutah.com](mailto:taylor@brightonhomesutah.com))**

**PROPERTY:**           **03-001-0125 & 03-001-0145  
(SAME AS OWNER'S ADDRESS)**

**ACREAGE:**           **6.1 GROSS ACRES**

**ZONING:**             **RESIDENTIAL-MEDIUM (R-M)**

**APPLICATIONS:**       **1. FINAL SITE PLAN APPROVAL  
2. CONDITIONAL USE PERMIT FOR 5-8 DWELLINGS  
PER ACRE**

**PROPOSED USE:**       **MULTI-FAMILY, (1) SINGLE-FAMILY DWELLING,  
TOTALING 47 UNITS**

**RECOMMENDATIONS:**   **a. CONSIDER APPROVAL OF THE FINAL SITE PLAN  
WITH CONDITIONS  
b. CONSIDER APPROVAL OF CUP REQUEST WITH  
CONDITIONS**

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**BACKGROUND**

The applicant proposes a 46 multi-family (*reduced by two units from earlier conceptual site plan*) with one (1) single-family townhome style community. The project currently consists of a singular development site. The site is to be developed with 46 townhomes, consisting of 10 buildings, and one (1) large existing single-family home, for a total of 47 dwellings on a gross

acreage of 6.16 acres (5.61 ac. net). The multi-family dwellings are two-story high buildings with pitched roofs built in sets of four (4) or five (5) units. Each dwelling will have a two-car attached garage and a driveway. The one (1) single-family unit consists of preserving the existing large rock home on the property rather than demolish it. All dwellings will be served by private internal roadway with two access points located along Porter Lane. The ingress/egress points of the project align with the two streets to the south serving the Shaela Park Development. According to the applicant, if approved by the City, the property would then be subdivided into a "planned unit development" to allow each dwelling to be individually purchased by a future resident.

## **FINAL SITE PLAN REVIEW, SECTION 12-21-110(e)**

### **R-M Uses Allowed - Chapter 12-32**

Within the Zoning Ordinance, the "R-M Uses Allowed" does permit both of the proposed primary uses within the Residential-Medium Zone (R-M) Zone. More specifically, the proposed multi-family uses are permitted up to four (4) units per gross acre and conditional for up to eight (8) units per gross acre (*see Table 12-32-1*). Furthermore, single-family dwellings are also conditional uses in the R-M Zone.

From staff's review of the final site plan, the total number of dwelling units is 47 with a density calculation of 47 divided by 6.16 acres (gross, not net). This equates to 7.62 units per gross acre (*code rounds to nearest tenth for density*). Thus, the project's overall use density would fall within the R-M conditional use allowance of a gross density of up to eight (8) dwelling units per acre.

### **General Plan - Section 12-480-3**

The project site is located in the Southwest Neighborhood Plan Area. The neighborhood plan indicates that the area from 500 West to the commercial area on the Frontage Road, may be appropriately developed with low to medium density residential. In addition, the plan encourages the use of "planned development" type use to act as a buffer between the commercial uses to the west and the single-family use areas in the neighborhood (*see Section 12-480-1.a*). The proposed uses will be developed in a "planned style" as a singular project and then later subdivided. It is planning staff's opinion that the project functions as a buffer between the commercial area of the Frontage Road and the interior neighborhood to the east, as desired in the City's General Plan.

<http://www.centervilleut.net/downloads/communitydevelopment/12-480-1-5.gp.current.8-8-2012.pdf>

### **Development Standards**

From review of the final site plan submittal, the development appears to be able to satisfy the applicable standards of Table 12-32-1 of the Zoning Ordinance, as summarized on the following page:

**R-M Development Standards****Table 12-35-1**

[http://www.centervilleut.net/downloads/communitydevelopment/chapter12-32\\_table\\_12-32-1\\_setback\\_standards\\_-\\_street\\_side\\_yard\\_-5-6-2014\\_revised\\_6-5-2014\\_.pdf](http://www.centervilleut.net/downloads/communitydevelopment/chapter12-32_table_12-32-1_setback_standards_-_street_side_yard_-5-6-2014_revised_6-5-2014_.pdf)

| Development Standard                    | Required                                           | Actual                     | Compliance |
|-----------------------------------------|----------------------------------------------------|----------------------------|------------|
| Building Standards                      |                                                    |                            |            |
| Maximum Height                          | 35 Feet                                            | 26.5 feet<br>(Two Stories) | Yes        |
| Distance Between Buildings              | 6 feet                                             | 15 to 60 Feet              | Yes        |
| Lot and Parcel Standards                |                                                    |                            |            |
| Minimum Area                            | 10,000 sq. ft.                                     | 6.1 Acres                  | Yes        |
| Setbacks                                |                                                    |                            |            |
| Front                                   | 25 Feet                                            | 25 Feet                    | Yes        |
| Rear                                    | 20 Feet                                            | 90 Feet                    | Yes        |
| Side                                    | 10/8 Feet                                          | East: 20/83 Feet           | Yes        |
|                                         |                                                    | West: 18 Feet              |            |
| Site Standards                          |                                                    |                            |            |
| Landscaping, Non-single Family Projects | 40% of Site                                        | 2.5 of 6.1 Acres<br>41%    | Yes        |
| Open Space Trees & Shrubs Requirement   | 1 Tree & 2 Shrubs per Dwelling Unit (47 Dwellings) | 85 trees<br>541 Shrubs     | Yes        |

**Applicable Off-street Parking and Landscaping Development Standards****Off-Street Parking - Chapter 12-52**

[http://www.centervilleut.net/downloads/communitydevelopment/chapter\\_12-52\\_-\\_off-street\\_parking\\_and\\_loading.pdf](http://www.centervilleut.net/downloads/communitydevelopment/chapter_12-52_-_off-street_parking_and_loading.pdf)

**Table 12-52-1**  
**Off-Street Parking Requirements**

| <b>Use</b>    | <b>Standard</b>                                           | <b>Provided</b>               | <b>Compliance</b> |
|---------------|-----------------------------------------------------------|-------------------------------|-------------------|
| Single-family | 2 spaces per dwelling                                     | Existing Garage               | Yes               |
| Multi-family  | 1.5 spaces per studio or 1 bed,<br>or 2 spaces per 2 bed+ | Double Car Garage<br>Per Unit | Yes               |
| <b>Total</b>  |                                                           | 92 Parking Stalls             | Yes               |

Nonetheless, keep in mind that the development has a “private road” servicing all of the dwelling units. This private roadway meets the Ordinance’s 24-foot minimum width required for internal circulation lanes for two-way traffic. Due to a fire code regulation requiring a minimum 20-foot clear lane, the 24-foot private road cannot allow for “on-street parking” (*see Fire Marshal Letter dated June 25, 2015*). Therefore, the plans will need to be amended to comply with the requirements of the Fire Marshal regarding marking the curbs in red and posting the sign restrictions.

**Landscaping & Screening - Chapter 12-51**

<http://www.centervilleut.net/downloads/communitydevelopment/chapter12-51.1-5-2011.pdf>

The submitted plans indicate the detailed location of landscaping and a tree & plant-type list and installation program has been provided. These plans were prepared by a landscape architect (required).

| <b>Required Landscaping Summary Chapter 12-51</b>   |                                                |                               |                                                                          |
|-----------------------------------------------------|------------------------------------------------|-------------------------------|--------------------------------------------------------------------------|
| <b>Guidelines</b>                                   | <b>Standard</b>                                | <b>Required Site Specific</b> | <b>Actual/Compliance</b>                                                 |
| Total Area Landscaping                              | 41%                                            | 2.5 of 6.1 Acres<br>40%       | Yes                                                                      |
| Total Required Trees                                | 1 Tree & 2 Shrubs per Dwelling Unit            | 85 trees<br>541 Shrubs        | Yes                                                                      |
| Trees for Street Frontage                           | 1 per 25 linear feet                           | 14 Required/<br>19 Provided   | Yes                                                                      |
| Total Interior Parking Lot Landscaping              | 10%                                            | Garage Parking Provided       | Not Applicable<br><br>(Parking lots less than 10 stalls – none required) |
| Total Interior Parking Lot Trees and Shrubs         | For every six <i>required</i> stalls: 1 tree   |                               |                                                                          |
| Total Interior Parking Lot Trees and Shrubs         | For every six <i>required</i> stalls: 2 shrubs |                               |                                                                          |
| Public Street Landscaping<br>(curb to interior lot) | 10 Feet for Local Streets                      | 25 provided                   | Yes                                                                      |

**Screening – Section 12-51-110**

The applicants have indicated that they plan to provide individual garbage can service for each dwelling through a private contracting company. Thus, additional screening for dumpsters is not required. However, the above ground utilities for the buildings need to be screened from view from any public right-of-way (*see Section 12-51-110.d*).

**Signage**

All signage requires separate permits and must be approved by the Zoning Administrator as part of the sign permit application, which must meet the requirements found in Chapter 12-54 of the Zoning Ordinance. The submitted plans depict an entry monument sign located at the east access drive.

[http://www.centervilleut.net/downloads/communitydevelopment/chapter\\_12-54\\_signs\\_city\\_council\\_freeway\\_oriented\\_signs\\_7-3-2013.pdf](http://www.centervilleut.net/downloads/communitydevelopment/chapter_12-54_signs_city_council_freeway_oriented_signs_7-3-2013.pdf)

**CONFORMANCE WITH CONCEPTUAL SITE PLAN ACCEPTANCE – SECTION 12-21-110.F.1**

On June 24, 2015, the Centerville City Planning Commission made a motion to accept the conceptual site plan for the Porter Lane Townhomes, to be located on property at 564 West Porter Lane, with the following conditions:

1. The applicant must submit a final site plan application meeting the standards found in Section 12-21-110(e) of the Zoning Ordinance.

*Staff Comment:* Submitted on July 1, 2015

2. The final site plan submittal must also address the following:

- a. The fire code regulation requiring a minimum 20-foot clear lane

*Staff Comment:* See Fire Marshal Letter – Dated 6/25/15

- b. How this fire requirement will be perpetually maintained, particularly with the visitor parking during family events, holidays, and other social activities

*Staff Comment:* See Fire Marshal Letter – Dated 6/25/15

- c. Details indicating the number of dumpsters to be provided

- d. All dumpsters must be completely screened from view with an opaque six-foot wall or fence

- e. The wall or fence must be compatible in material and color of the main buildings on the site.

*Staff Comment:* Individual garage can service to be provided – Private Contractor

- f. Provide a Landscaping Plan, prepared by a landscape architect, which must be submitted to address the standards of Chapter 12-51-Landscaping & Screening

*Staff Comment:* Plans have been stamped by licensed landscape architect

3. A site signage package must be submitted for review by the Planning Commission and the Zoning Administrator in accordance with Chapter 12-54-Signs.

*Staff Comment:* Entrance location of sign provided – Separate permit required

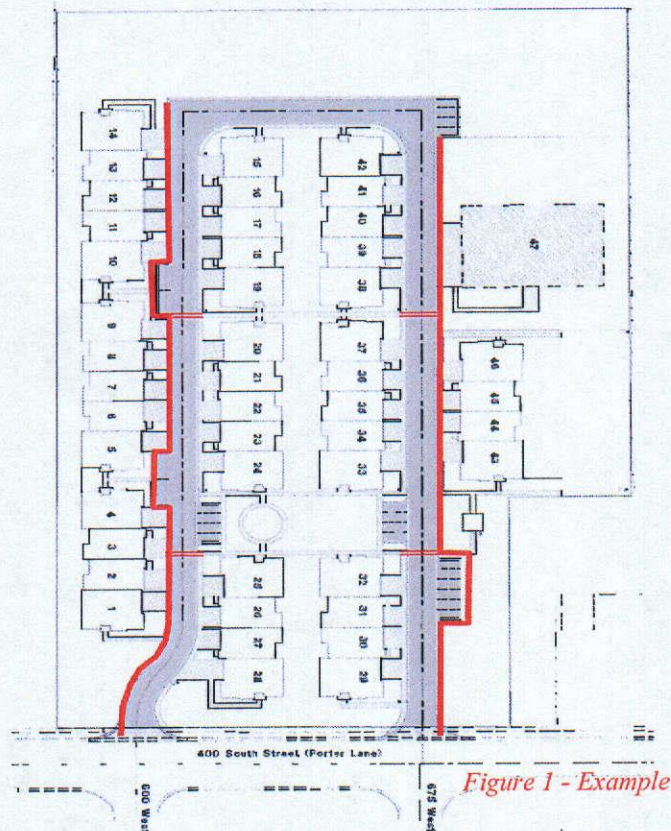
4. The developer should look at and address:

- a. Rearrangement of green open space to allow for better access to the community in general  
*Staff Comment:* The plans depict the elimination of two dwellings involving the buildings fronting Porter and combining that space with the building separation area to create a 60-foot wide interior island common area with a tot-lot (see plans).

- b. Impact on the pedestrian situation in the community, specifically sidewalks and interconnectivity

*Staff Comment:* The plans depict sidewalks on both sides of the private street, adjacent to the curb. In addition, sidewalk links are provided within the interior block. Staff is

concerned about the driveway depths, which will block the sidewalks when vehicles park in the driveways. Staff suggests an alternative plan adjusting the driveway depths on the outside parameter, eliminating the interior loop, and linking the interior walks with the parameter system, then out to the public system on Porter Lane (see Figure 1 – Example).



Generally, staff believes that the final site plan submittal substantially reflects the conceptual plan acceptance and depicts how the site could be appropriately developed in accordance with the applicable provisions of the Residential-Medium (R-M) Zone (see Section 12-21-110.d&f). Nonetheless, the allowance for the requested density use of eight (8) units per acre is subject to the additional provisions regarding conditional use permit (Section 12-21-100), which will be addressed later in this report.

## PLANNING STAFF RECOMMENDATION – FINAL SITE PLAN

**PROPOSED ACTION #1:** I hereby make a motion for the Planning Commission to **APPROVE** the Final Site Plan for the Porter Lane Townhomes Project, to be located on property at 564 West Porter Lane, with the following conditions:

1. The project shall be developed in conformance with the submitted site and elevation plans dated July 1, 2015 (as also reviewed by the Planning Commission 7/22/2015), and as amended with this approval.

2. The final site plan density depicted shall be subject to the review and approval of a Conditional Use Permit Use Density between 5-8 units per gross acre.
3. The final site plan submittal shall be amended to accomplish the following:
  - a. Compliance with the South Davis Fire Marshal Letter dated June 25, 2015 and/or as deemed acceptable by the Fire Marshal in accordance with the applicable provisions of the adopted Fire Code.
  - b. All above ground utilities for the buildings shall be screened from view from any public right-of-way (*see Section 12-51-110.d*).
  - c. All use of interior lighting shall comply with Section 12-55-140, Outdoor Lighting Standards.
  - d. The internal sidewalk system shall be revised, as follows:
    - Provide sidewalks along the outside roadway loop only
    - Adjust the driveway depths to accommodate an 18-foot parking depth and the sidewalk system without blocking the walkway with vehicles
    - Connect the interior area walks, through the common space, to the outside roadway loop with crosswalks
    - Outside sidewalk loop connects to the public sidewalk system on Porter Lane
4. The project shall be subject to the construction of roadway, utility, and service improvements and associated fees and bonding in accordance with applicable City Ordinances or laws and deemed acceptable by the City Engineer or other City staff.
5. The project shall secure and provide private refuse (*i.e. garbage*) service for each dwelling inside the development.
6. All signage requires separate permits and are to be approved by the Zoning Administrator as part of the sign permit application, and must meet the requirements found in Chapter 12-54 of the Zoning Ordinance.
7. The project shall be subject to obtaining a subdivision approval from the City prior to selling any parcel, lot, or tract within the development.

***SUGGESTED REASONS FOR THE ACTION:***

- a) The final site plan submittal has adequately shown how the property may be developed [Sections 12-21-110.d & f].
- b) The development is consistent with the goals and objectives found within the Centerville City General Plan [Section 12-480-3].
- c) The final site plan substantially reflects the conceptual plan acceptance of June 24, 2015.
- d) The proposed final site plan, with the conditions listed, meets the applicable Development Standards for the R-M Zone, Off-Street Parking, and the Landscaping and Screening Standards of the Zoning Ordinance.

---

**CONDITIONAL USE PERMIT REVIEW, SECTION 12-21-100.**

[http://www.centervilleut.net/downloads/communitydevelopment/chapter\\_12-21\\_as\\_approved\\_3-4-2014.pdf](http://www.centervilleut.net/downloads/communitydevelopment/chapter_12-21_as_approved_3-4-2014.pdf)

According to Table 12-32-1 for the R-M Zone, a use density of 5-8 dwellings may be established through applying for a Conditional Use Permit (CUP). In conjunction with Brighton Home's

request for final site plan approval, the application includes a request for the Commission to approve a CUP for the desired density of 7.62 units per gross acre. The CUP review and approval criteria are listed in Section 12-21-100 of the Zoning Ordinance. A summary of the approval standards are being provided, as follows:

- ✚ **Suitability of the Land for Requested Use** – the property was formally used for large single-family home on predominately vacant or under-utilized land. The property is surrounded by other commercial uses to the north and west, R-M (*Shalea Park*) and A-L (*single-family*) area to the south, and church site (A-L) to the east. The property fronts on Porter Lane that is a major collector road linking 400 West to the Frontage Road and the Interstate.

The property is generally flat and the multi-family use and development layout is consistent with the area's neighborhood plan (*see site plan review section*). The area on the north end has a drainage conservation easement held by the Army Corps. Of Engineers and may be landscaped, but not developed with buildings and/or hard surfacing. The development plans incorporate this area as open green space and will be grassed on the east half of the easement to allow passive and informal active use by residents of the development. Generally, staff believes that the property is suitable for further development beyond the current developed conditions of the property.

- ✚ **Potential or Injurious Impacts to the Surroundings** – The major focus for staff during conceptual review was the drainage system for the property. Initially, a portion of the site was to drain to the north and the remaining to drain to the south. The City Engineer has reviewed the plans and has determined that changes and corrections to the final plans are needed to ensure proper storm water management of the site. However, the City Engineer believes that proper drainage for the site is feasible (*verbal verification by phone on July 17, 2015*).

- ✚ **Adequate Facilities and Services for the Site and its Surroundings** – As part of their development proposal, a traffic study was performed for the development of the site (*see attached study by Reeves & Associates, Inc.*). The study concludes that adequate traffic capacity exists for allowing the proposed development (*Level of Service "C"*). However, City staff will be reviewing the study and likely using another company to assess the traffic for this area and determine how the City will be funding a future signal as part of the Redevelopment Agency's budget. Thus, staff recommends that if it is further deemed necessary that this project may be subject to mitigating their direct portion of the traffic generated at the intersection of 400 West and Porter Lane.

Additionally, during conceptual site plan review staff raised the issue of fire access vs. on-street parking. The applicant has submitted their plans for review by the Fire Marshal (*see attached letter dated June 25, 2015*). With compliance of the Fire Marshal's directives and the parking ratio of over 4 stalls per dwelling, there is sufficient capacity to mitigate these initial concerns. Staff does not believe additional mitigation measures can be justified.

- ★ **Safeguards Preventing or Minimizing Noise, Odors, Glare, Dust, Etc.** – Generally, staff does not believe there are other significant concerns regarding these issues. However, the Commission might keep in mind that use of garbage trucks, deliveries, lighting, and other normal residential-type activities are subject to various City Regulations and Noise Ordinances to prevent such activities from becoming a nuisance.

## PLANNING STAFF RECOMMENDATION – CONDITIONAL USE PERMIT

**PROPOSED ACTION #2:** I hereby make a motion for the Planning Commission to **APPROVE** the Conditional Use Permit (CUP) application for the Porter Lane Townhomes Project, to be located on property at 564 West Porter Lane, with the following conditions:

1. This conditional use is limited and subject to the development of the property, as submitted and approved with the related final site plan of July 1, 2015, as amended.
2. The density use of the property shall not exceed 47 units and 7.62 units per gross acre.
3. The development shall comply with the Fire Marshal's Letter dated June 25, 2015 and/or applicable fire codes, which at a minimum are:
  - a. Marking the private roadway curbs in red, and
  - b. Posting the signs relating to the "no parking" restrictions
4. If it is further deemed necessary by the City Engineer, this project be subject to mitigate their direct portion of the traffic generated at the intersection of 400 West and Porter Lane.

### **SUGGESTED REASONS FOR THE ACTION:**

- a) According to Table 12-32-1 for the R-M Zone, a use density of 5-8 dwellings may be established through an approved conditional use permit (CUP).
- b) A conditional use permit application to consider allowing multi-family density of up to 8 units per acre must address the standards found in Section 12-21-100(e) of the Zoning Ordinance.
- c) The property is generally flat and suitable for further development, while the multi-family use and development layout is consistent with the area's neighborhood plan.
- d) The City Engineer, with corrections and changes, has determined that proper drainage for the site is feasible.
- e) The traffic study concludes that adequate traffic capacity exists for allowing the proposed development (*Level of Service "C"*).
- f) Compliance with the Fire Marshal's directives and the parking ratio of over 4 stalls per dwelling, there is sufficient capacity to mitigate the initial concerns regarding access, circulation, and parking.
- g) The use of garbage trucks, deliveries, lighting, and other normal residential-type activities are subject to various City Regulations and Noise Ordinances to prevent such activities from becoming a nuisance.
- h) With the conditions listed and the development subject to the design and layout of the associated final site plan, the density use approved is deemed appropriate for the property.

# South Davis Metro Fire Agency

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**Fire Prevention Division**

## COMMERCIAL PLAN REVIEW & COMMENTS

| PROJECT:                            |  | ADDRESS:            |  |
|-------------------------------------|--|---------------------|--|
| CONTACT PERSON: Donna Wilkinson     |  | PHONE: 801-677-6438 |  |
| EMAIL: dwilkinson@centervilleut.com |  |                     |  |
| ENGINEER: Reeve and Assoc. Inc.     |  | PHONE: 801-621-3100 |  |
| EMAIL:                              |  | FAX: 801-621-2666   |  |
| FIRE MARSHAL: David Powers          |  | PHONE: 801-677-2400 |  |
| EMAIL: dpowers@sdmetrofire.org      |  | FAX: 801-677-0166   |  |
| REVIEWED BY: David Powers           |  | PHONE: 801-677-2400 |  |
| EMAIL: dpowers@sdmetrofire.org      |  | FAX: 801-677-0166   |  |

Digitally signed by David K. Powers  
DN: cn=David K. Powers, o=South  
Dakota Metro Fire Agency,  
c=US  
Date: 2015.02.14 14:29:30 -0500

David K.  
Powers

Digitally Signed by David K. Powers  
DN: cn=David K. Powers, o=South  
Davis Metro Fire Agency,  
ou=Fire Prevention  
email=dpowers@sdmetrofire.org,  
c=US  
Date: 2015.07.14 14:29:30 -0500

### 2012 IBC, IFC, & current NFPA Standards used for review

This review does not imply that all conditions were identified, and does not annul requirements identified by said codes.

**DATE:** June 25, 2014

**OCCUPANCY:** Res.

**CONSTRUCTION TYPE:** VB

**#STORIES:** 2

**FIRE SPRINKER:** No

**FIRE FLOW:** 1,500 GPM

**HYDRANTS NEEDED:** 2

### FIRE DEPARTMENT REVIEW COMMENTS

1. Hydrant amount and distribution is acceptable to fire authority.
2. Assumption is town homes built to Residential Code as adopted by the State of Utah.
3. All roads are 24 feet in width which requires all curbs to be marked red with posted signs reading "NO PARKING - FIRE LANE" (IFC 503.3).



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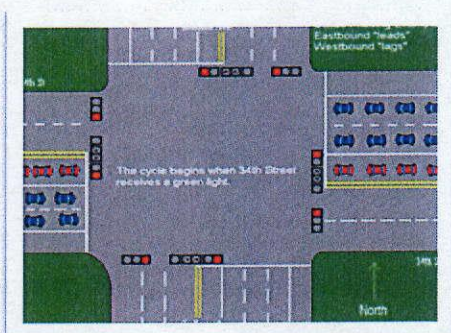
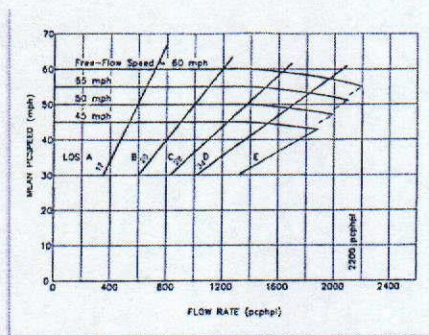
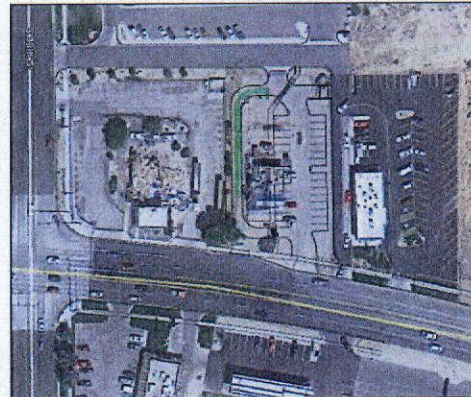
# Traffic Impact Study

## Porter Walton Townhomes - Centerville, UT

Submitted to:

Mr. Patrick Scott  
Brighton Homes Utah, LLC  
215 North Redwood Road, Suite 8  
North Salt Lake City, UT 84054

FIGURE #2  
SITE LAYOUT



Prepared by:  
Reeve & Associates, Inc.  
920 Chambers St., Ste. 14  
Ogden, UT 84403  
801.621.3100  
www.reeve-assoc.com

July 8, 2015

Reeve Job No.: 6440-02

# Reeve & Associates, Inc.



July 8, 2015

Mr. Patrick Scott  
Brighton Homes Utah, LLC  
215 North Redwood Road, Suite 8  
North Salt Lake City, UT 84054

***RE: Porter Walton Townhomes – Traffic Impact Study***

Dear Mr. Scott:

As per your request, we are submitting to you this report of the traffic impact study for the residential development located on Porter Lane near 400 West in Centerville UT.

To perform this report we performed a traffic study at the accesses of Porter Lane. Manual traffic counts were used in the study. Based on the information we obtained, we were able to analyze the existing roadway system and the existing accesses to the site. From this data, we generated a future traffic impact analysis for the proposed development. This analysis showed that the potential traffic generated from the store would have no increased impact upon the Level of Service of Porter Lane and 400 West. Therefore it is our professional opinion that upon completion; this project will not significantly alter the existing traffic patterns, and should be permitted per the traffic data contained within this report.

If you have any questions, or we can be of further assistance, please let us know.

Sincerely,

Nate Reeve, P.E.  
Principal Engineer  
Reeve & Associates, Inc.

Shane Taggart, E.I.T.  
Civil Engineer  
Reeve & Associates, Inc.

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## **1.0 Introduction and Summary**

### **1.1 Purpose of report and study objectives**

At the request of the owner, Reeve & Associates was asked to perform a traffic impact analysis involving the proposed Townhome development located at 400 West and Porter Lane in Centerville, Utah.

The objective of this study was to: assess the existing traffic flow and distribution, forecast any additional traffic generated from the residential development, determine the projected Level of Service to the existing roadway and surrounding area to the build-out year.

### **1.2 Executive Summary**

The proposed development is located 400 West and Porter Lane in Centerville, Utah. Figure #1 contains a vicinity map that shows the proposed location. The traffic study area was determined by analyzing the roadways that would be influenced by the generated traffic from the proposed store. Our manual traffic counts at the intersection of 400 West and Porter Lane and at the existing accesses.

Our principal findings from our traffic impact analysis have determined the following results. The projected increase of traffic flow from the proposed residential development does not significantly alter the existing Level of Service. The intersection currently has a Level of Service (LOS) C, and will operate at the same LOS upon completion of the residential development. Each access will operate at a LOS A upon completions. Therefore, it is our professional opinion that the traffic generated from the proposed development will not significantly alter the existing traffic patterns after the proposed accesses are completed.



**Figure #1**  
**Vicinity Map**



## **2.0 Area Conditions**

### **2.1 Site Accessibility**

The proposed residential development will be accessible from two access on Porter Lane. (See Figure #2) A traffic impact analysis was performed at the location of the accesses. Both accesses are full movement. A traffic impact analysis was performed at the location of the existing accesses.

### **2.2 Existing Traffic Conditions**

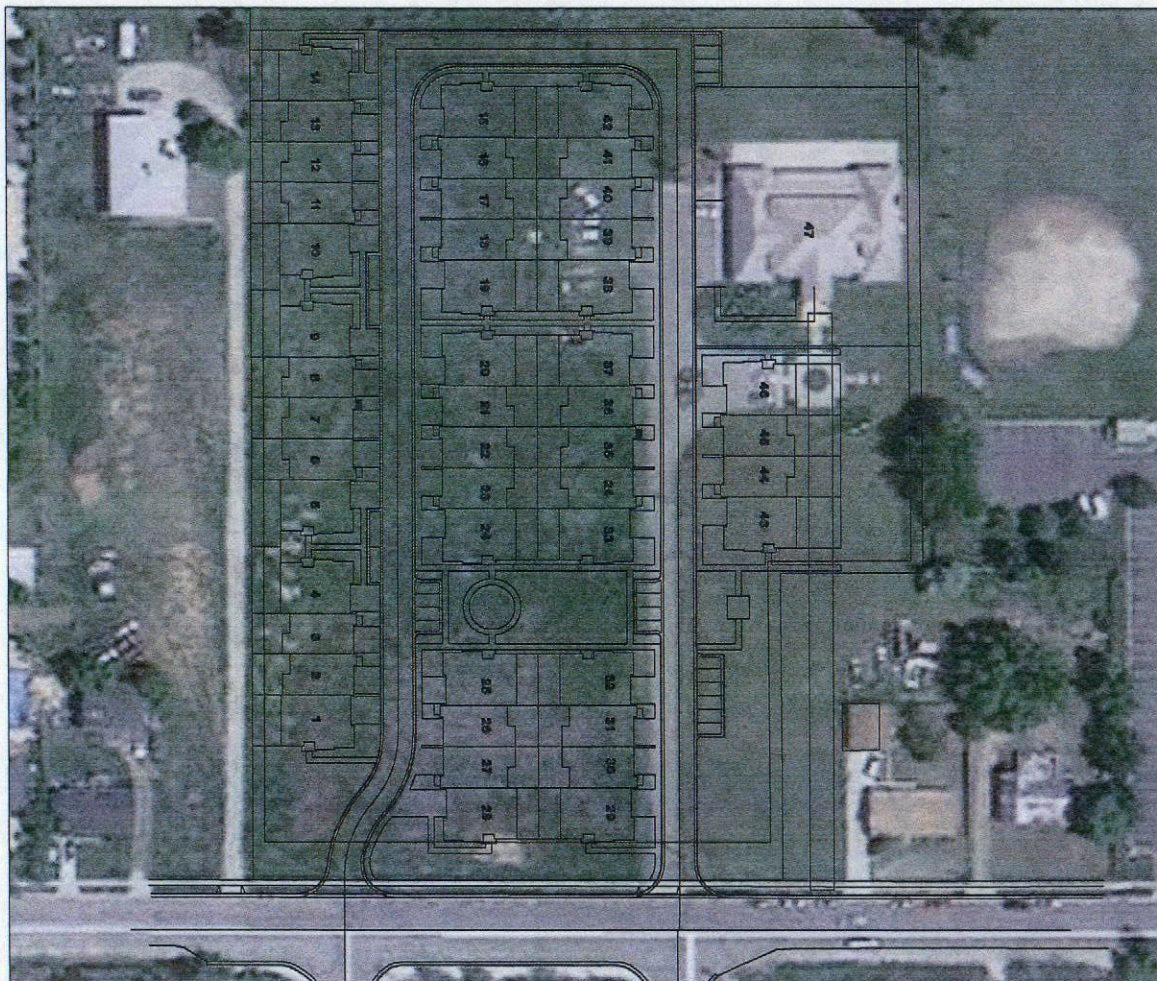
The study area is the area around the intersection of 400 West and Porter Lane in Centerville, Utah. The existing site is vacant and undeveloped. Porter Lane is a 2 lane road, running east-west, with one lane in each direction. The existing traffic distribution for the P.M. peak hour is shown in Figure #3.

### **2.3 Existing Traffic Volumes**

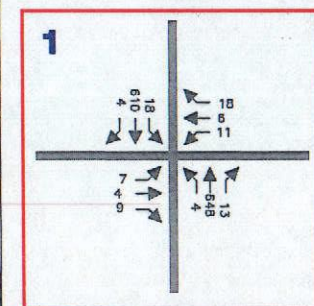
Existing traffic volumes were recorded by Reeve & Associates in July 2015 for the P.M. peak hour at the intersection and accesses on 400 West and Porter Lane. The existing traffic volumes assisted in determining the existing and projected Level of Service for the roadways.



**FIGURE #2  
SITE LAYOUT**



**FIGURE #3  
EXISTING PEAK HOUR TRAFFIC VOLUMES**



## 3.0 Study Area Level of Service

### 3.1 Level of Service

Level of service (LOS) is a system of values used to designate the service provided to the public. In the case of traffic operations, LOS refers to the ability of vehicles to travel through the circulation system with a measured amount of delay or speed. According to the 2000 Highway Capacity Manual, the official definition of LOS is: *A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.*

Typically, LOS is measured by a system of letters designating various levels of operating conditions for different types of roadway facilities (i.e. Roadways, signalized intersections, unsignalized intersections.) For this study, the standard system of letter designations will be used to identify the resulting performance measures for each study location using letters A through F, with F being the least desirable.

- LOS A** Level of service 'A' describes completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by driver preferences. Vehicles are spaced at an average of 440 feet at a maximum density of 12 passenger cars per mile per lane. Maneuverability within the traffic stream is good. Minor disruptions to flow are easily absorbed at this level without a change in travel speed.
- LOS B** Level of service 'B' is also indicative of free flow, although the presence of other vehicles begins to be noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver. Vehicles are spaced at an average of approximately 264 feet at a maximum density of 20 passenger cars per mile per lane. Minor disruptions are still easily absorbed at this level, although localized deterioration in level of service will be more obvious.
- LOS C** Level of service 'C' represents a range in which the influence of traffic density on operation becomes marked. The ability to maneuver within the traffic stream is now clearly affected by the presence of other vehicles. Average travel speeds begin to show some reduction for multilane highways with free-flow speeds over 50 mph. The average spacing of vehicles is reduced to approximately 189 feet at a maximum density of 28 passenger cars per mile per lane. Minor disruptions may be expected to cause serious local deterioration in service, and queues may form behind any significant traffic disruptions.



- LOS D*** Level of service 'D' represents a range in which ability to maneuver is severely restricted because of traffic congestion. Travel speed begins to be reduced by increasing volumes. The average spacing of vehicles is 155 feet at a maximum density of 34 passenger cars per mile per lane. Only minor disruptions can be absorbed without the formation of extensive queues and the deterioration of service.
- LOS E*** Level of service 'E' describes operations at capacity. Operations at this level are volatile, there being virtually no useable gaps in the traffic stream. Vehicles are spaced at approximately six car lengths, leaving little room to maneuver within the traffic stream at speeds that are still over 49 mph. Any distribution to the traffic stream, such as vehicles entering from a ramp or a vehicle changing lanes, can establish a disruption wave that propagates throughout the upstream traffic flow. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is poor.
- LOS F*** Level of service 'F' describes breakdowns in vehicular flow. Such conditions generally exist within queues behind breakdown points. Such breakdowns can occur for a number of reasons: Traffic incidents cause a temporary reduction in the capacity of a short segment, Points of recurring congestion exist, In forecasting situations, any location where the projected peak-hour (or other) flow rate exceeds the estimated capacity of the location presents a problem.



### 3.2 Level of Service Analysis

For this study the Level of Service was determined by calculating the average delay time per vehicle in seconds using McTrans HCS2010. Each Level of Service is associated with a designated range of delay times in seconds/vehicle.

The following table, Table 1, is used to determine the Level of Service (LOS) for a signalized intersection based on the delay in seconds per vehicle.

**Table 1 - Signalized Intersections Level of Service**

| <b>LOS</b> | <b>Intersection Delay per Vehicle (sec/veh)</b> |
|------------|-------------------------------------------------|
| <b>A</b>   | $\leq 10$                                       |
| <b>B</b>   | $> 10 - 20$                                     |
| <b>C</b>   | $> 20 - 35$                                     |
| <b>D</b>   | $> 35 - 55$                                     |
| <b>E</b>   | $> 55 - 80$                                     |
| <b>F</b>   | $> 80$                                          |

Source: Highway Capacity Manual (HCM) 2000, Transportation Research Board  
National Research Council Washington D.C. 2000.

The following table, Table 2, is used to determine the Level of Service (LOS) for an unsignalized intersection based on the delay in seconds per vehicle.

**Table 2 - Unsignalized Intersections Level of Service**

| <b>LOS</b> | <b>Intersection Delay per Vehicle (sec/veh)</b> |
|------------|-------------------------------------------------|
| <b>A</b>   | $\leq 10$                                       |
| <b>B</b>   | $> 10 - 15$                                     |
| <b>C</b>   | $> 15 - 25$                                     |
| <b>D</b>   | $> 25 - 35$                                     |
| <b>E</b>   | $> 35 - 50$                                     |
| <b>F</b>   | $> 50$                                          |

Source: Highway Capacity Manual (HCM) 2000, Transportation Research Board  
National Research Council Washington D.C. 2000.

According to the Highway Capacity Manual, most facilities are designed for a service flow rate at LOS D or better to ensure acceptable operating conditions.

### 3.3 Study Area Level of Service

Given the existing conditions on Porter Lane and 400 West, the operating Level of Service was determined using McTrans HCS2010. The results are shown below in Table 3.



**Table 3 – Existing Level of Service for Study Area**

| <i>Studied Intersection</i>    | <i>Delay (sec/veh)</i> | <i>LOS</i> |
|--------------------------------|------------------------|------------|
| <b>400 West/Porter Lane</b>    | 15.5                   | C          |
| <b>East Access/Porter Lane</b> | -                      | -          |
| <b>West Access/Porter Lane</b> | -                      | -          |

Source: Delay times and LOS determined using McTrans HCS2010.



## 4.0 Projected Traffic

### 4.1 Trip Generation

The number of new trips that will be generated for the proposed residential development was determined using trip generation figures obtained from ITE Trip Generation Manual 9<sup>th</sup> Edition. For this traffic impact study, Residential Condominium/Townhouse (230) was the figure used.

#### 4.1.1 Trip Generation

Per ITE, it is assumed that 0.44 A.M. trips per hour are generated per dwelling unit and 0.52 P.M. trips per hour generated dwelling unit.

The proposed residential development will consist of 49 dwelling units. The proposed trip generation based on 49 dwelling units is 22 trips per hour during A.M. peak hour flow and 26 trips per hour during P.M. peak hour flow. Per ITE, it was assumed that 64% of the generated traffic will be entering the site, and 36% leaving the site. It was concluded that the proposed residential development will generate 17 trips per hour entering the site and 9 trips per hour exiting the site.

See Table 4 below to see the overall results of the Trip Generation.

**Table 4 – Trip Generation**

| <i>Peak</i> | <i>Generated Trips/Peak Hour</i> | <i>Trips Entering</i> | <i>Trips Exiting</i> |
|-------------|----------------------------------|-----------------------|----------------------|
| <i>AM</i>   | 26                               | 17                    | 9                    |

### 4.2 Trip Distribution

Trip distributions were assumed based from the existing traffic patterns obtained from manual traffic counts performed at Porter Lane and 400 West. See Figure #3 for trip distribution.

### 4.3 Trip Assignment

The amount of trips that are to be assigned into the existing traffic network were calculated based off the trip distributions assumptions using the total Trips Generated shown in Table 4 above. The results are shown in Figure #5.

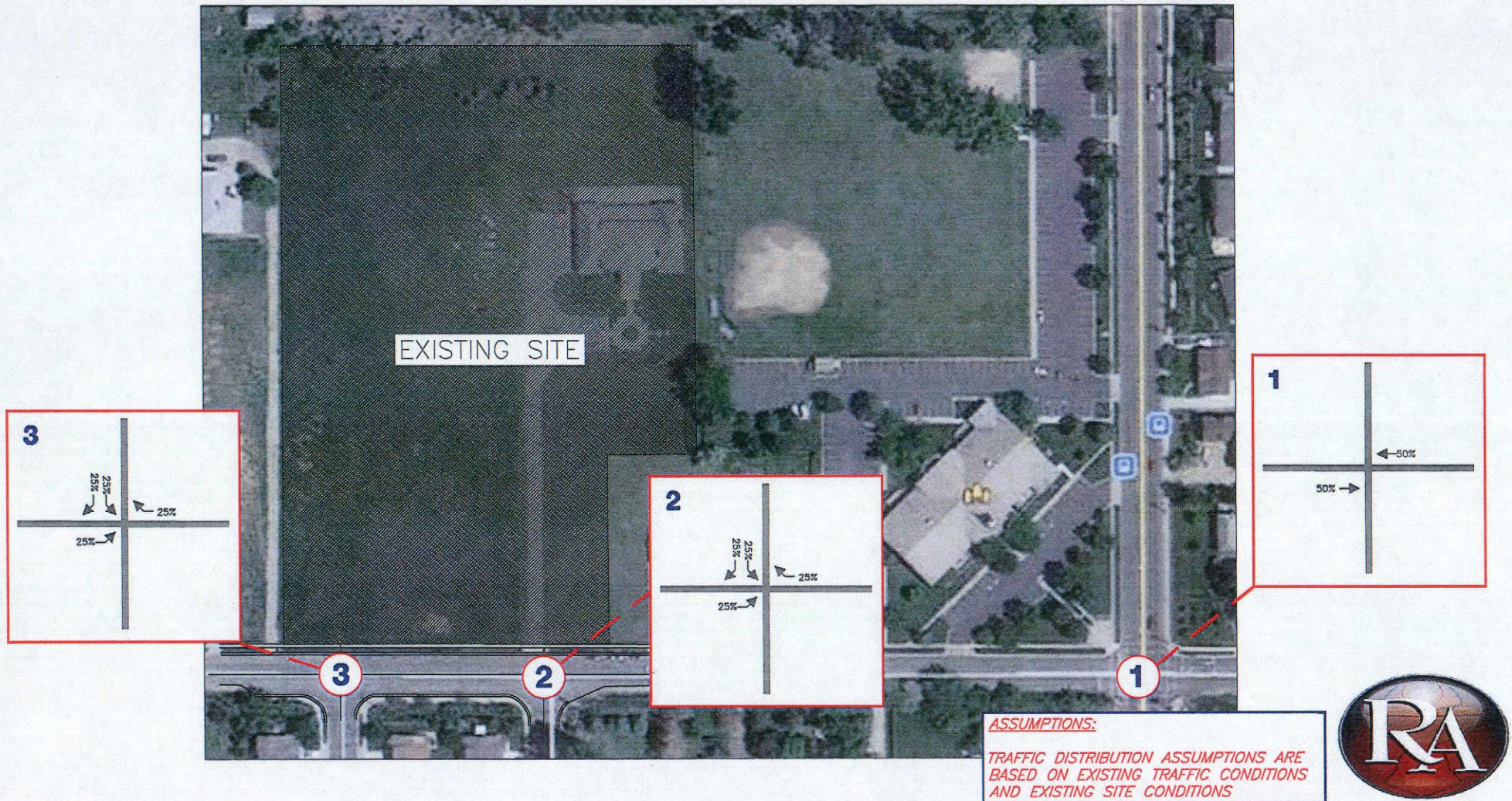


#### **4.4 Total Traffic**

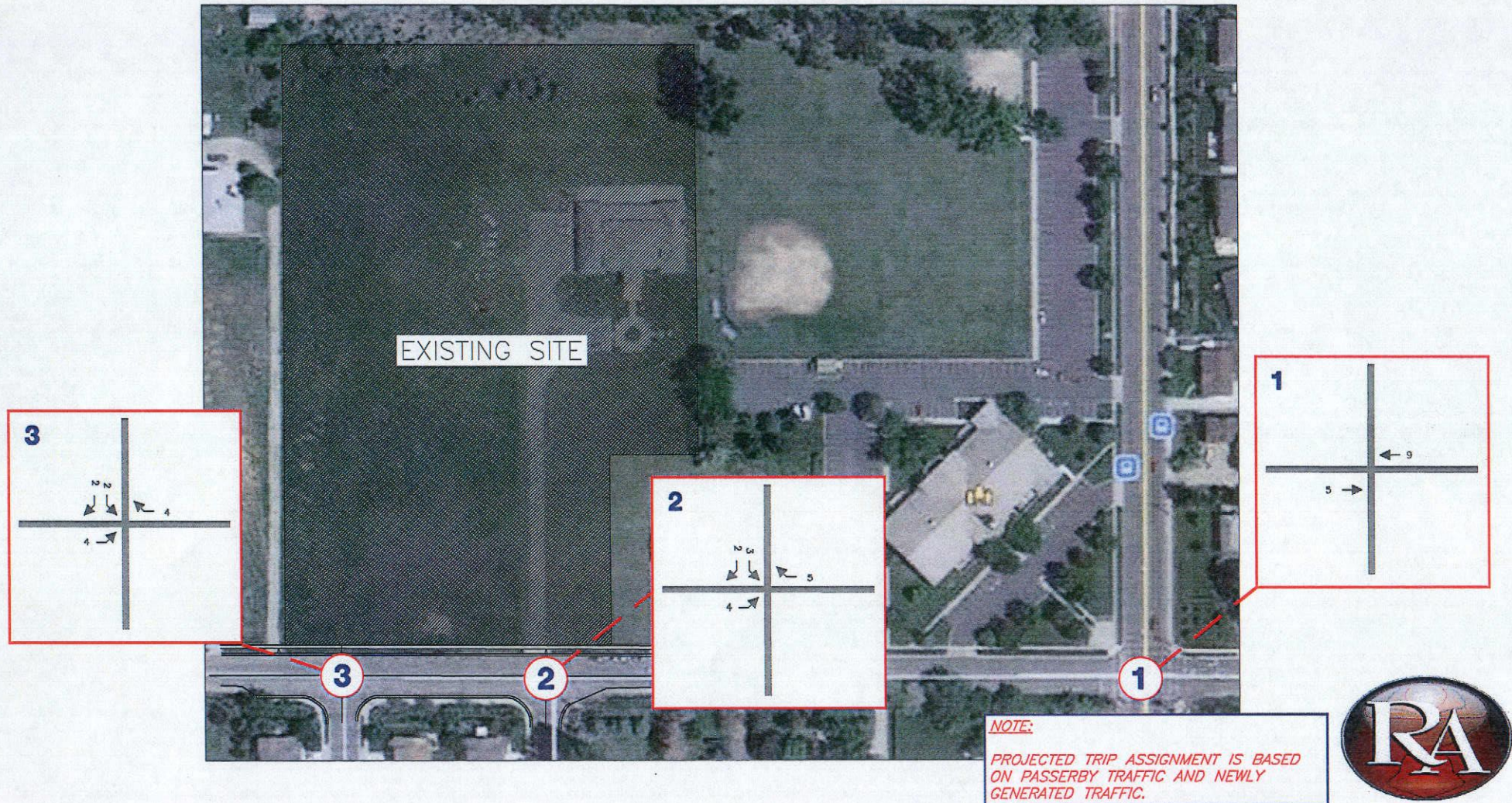
Figure #6 shows the total traffic for the new proposed development to the build-out year. Projected total traffic conditions include existing traffic volumes plus the new trip generation and assignments described above. The residential development will have no effect on the Level of Service on Porter Lane.



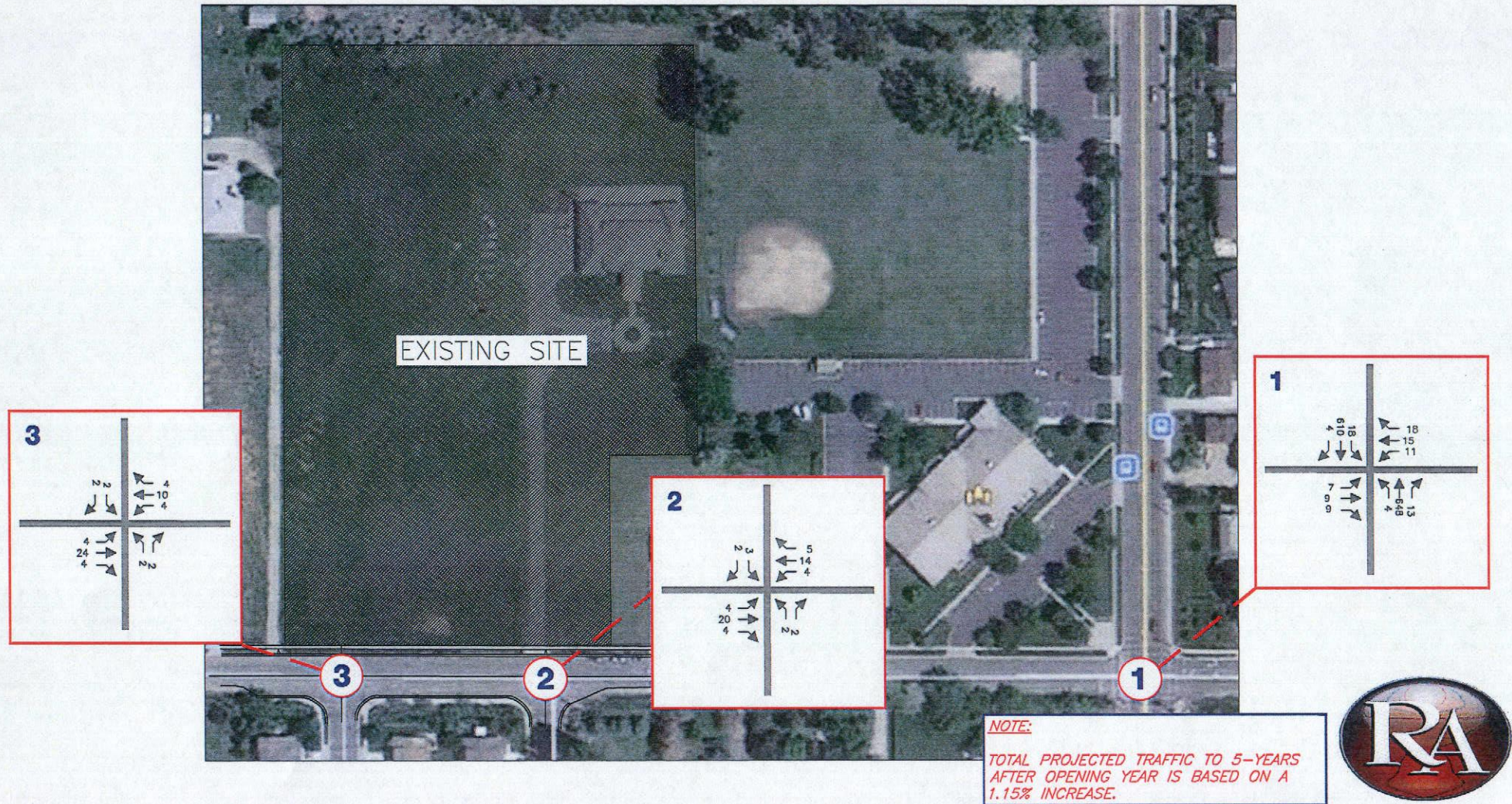
**FIGURE #4  
ASSUMED VEHICLE TRIP DISTRIBUTION**



**FIGURE #5  
PROJECTED TRIP ASSIGNMENT**



**FIGURE #6**  
**TOTAL PROJECTED PEAK HOUR TRAFFIC VOLUMES**



## 5.0 Results

Based on current conditions, combined with the projected traffic flows from the proposed residential development, we have prepared a study of the accesses on Porter Lane. The results of the study are shown in Table 5.

**Table5 – Existing, Proposed Level of Service for Study Area**

| <i>Studied Intersection</i>           | <i>Delay<br/>(sec/veh)</i> | <i>LOS</i> | <i>Delay<br/>(sec/veh)</i> | <i>LOS</i> |
|---------------------------------------|----------------------------|------------|----------------------------|------------|
| <b><i>400 West/Porter Lane</i></b>    | <i>15.5</i>                | <i>C</i>   | <i>18.3</i>                | <i>C</i>   |
| <b><i>East Access/Porter Lane</i></b> | <i>-</i>                   | <i>-</i>   | <i>8.4</i>                 | <i>A</i>   |
| <b><i>West Access/Porter Lane</i></b> | <i>-</i>                   | <i>-</i>   | <i>8.4</i>                 | <i>A</i>   |

Source: Delay times and LOS determined using McTrans HCS2010.

The Level of Service at Porter Lane and 400 West will operate at a LOS C or better, with the slight increase in delay due to the generated traffic from the new development. The Porter Lane accesses will operate at a LOS A upon completion of the new development and have minimal effect to the movement LOS at this access point.



## **6.0 Conclusion's & Recommendations**

The study concludes that the completion of the project will have little impact upon the existing Level of Service in the studied area. Therefore, it is our professional opinion that the traffic generated from the proposed residential development will not significantly alter the existing traffic patterns after the proposed accesses are completed.



## **Appendix**





## Porter Lane Townhomes

### TRIP GENERATION

7/8/15 SKT 6440-02

#### A.M. Peak Hour Trip Generation

Land Use: Residential Condominium/Townhouse (230)

Code: 230

Dwelling Units 49 s.f.

Total Number of Trips per Hour=

ITE Trip Generation 9th Edition, Volume 2 page 397

From Graph

T= Ave Vehicle Trip Ends

X= Dwelling Units

T= 22

Trip Directional Distribution: 19% entering, 81% exiting

|           |    |
|-----------|----|
| Entering= | 4  |
| Exiting=  | 17 |

P.M. Land Use: Residential Condominium/Townhouse (230)

Code: 230

Dwelling Units 49 s.f.

Total Number of Trips per Hour=

ITE Trip Generation 9th Edition, Volume 2 page 398

From Graph

T= Ave Vehicle Trip Ends

X= Dwelling Units

T= 26

Trip Directional Distribution: 64% entering, 36% exiting

|           |    |
|-----------|----|
| Entering= | 17 |
| Exiting=  | 9  |

| TWO-WAY STOP CONTROL SUMMARY                     |                      |            |           |                           |                       |           |      |
|--------------------------------------------------|----------------------|------------|-----------|---------------------------|-----------------------|-----------|------|
| <b>General Information</b>                       |                      |            |           | <b>Site Information</b>   |                       |           |      |
| Analyst                                          | Reeve and Associates |            |           | Intersection              | Porter Lane and 400 W |           |      |
| Agency/Co.                                       | Reeve and Associates |            |           | Jurisdiction              | Centerville           |           |      |
| Date Performed                                   | 7/16/2015            |            |           | Analysis Year             | 2015                  |           |      |
| Analysis Time Period                             | Peak Hour            |            |           |                           |                       |           |      |
| Project Description Porter Walton Townhomes      |                      |            |           |                           |                       |           |      |
| East/West Street: Porter Lane                    |                      |            |           | North/South Street: 400 W |                       |           |      |
| Intersection Orientation: North-South            |                      |            |           | Study Period (hrs): 0.25  |                       |           |      |
| <b>Vehicle Volumes and Adjustments</b>           |                      |            |           |                           |                       |           |      |
| Major Street                                     | Northbound           |            |           | Southbound                |                       |           |      |
| Movement                                         | 1                    | 2          | 3         | 4                         | 5                     | 6         |      |
|                                                  | L                    | T          | R         | L                         | T                     | R         |      |
| Volume (veh/h)                                   | 4                    | 648        | 13        | 18                        | 610                   | 4         |      |
| Peak-Hour Factor, PHF                            |                      |            |           |                           |                       |           |      |
| Hourly Flow Rate, HFR (veh/h)                    | 4                    | 648        | 13        | 18                        | 610                   | 4         |      |
| Percent Heavy Vehicles                           | 0                    | --         | --        | 0                         | --                    | --        |      |
| Median Type                                      | Undivided            |            |           |                           |                       |           |      |
| RT Channelized                                   |                      |            | 0         |                           |                       | 0         |      |
| Lanes                                            | 1                    | 1          | 0         | 0                         | 1                     | 1         |      |
| Configuration                                    | L                    |            | TR        | LT                        |                       | R         |      |
| Upstream Signal                                  |                      | 0          |           |                           | 0                     |           |      |
| Minor Street                                     | Eastbound            |            |           | Westbound                 |                       |           |      |
| Movement                                         | 7                    | 8          | 9         | 10                        | 11                    | 12        |      |
|                                                  | L                    | T          | R         | L                         | T                     | R         |      |
| Volume (veh/h)                                   | 7                    | 4          | 9         | 11                        | 6                     | 18        |      |
| Peak-Hour Factor, PHF                            |                      |            |           |                           |                       |           |      |
| Hourly Flow Rate, HFR (veh/h)                    | 7                    | 4          | 9         | 11                        | 6                     | 18        |      |
| Percent Heavy Vehicles                           | 0                    | 0          | 0         | 0                         | 0                     | 0         |      |
| Percent Grade (%)                                | 0                    |            |           | 0                         |                       |           |      |
| Flared Approach                                  |                      | N          |           |                           | N                     |           |      |
| Storage                                          |                      | 0          |           |                           | 0                     |           |      |
| RT Channelized                                   |                      |            | 0         |                           |                       | 0         |      |
| Lanes                                            | 0                    | 1          | 0         | 0                         | 1                     | 1         |      |
| Configuration                                    |                      | LTR        |           | LT                        |                       | R         |      |
| <b>Delay, Queue Length, and Level of Service</b> |                      |            |           |                           |                       |           |      |
| Approach                                         | Northbound           | Southbound | Westbound |                           |                       | Eastbound |      |
| Movement                                         | 1                    | 4          | 7         | 8                         | 9                     | 10        | 11   |
| Lane Configuration                               | L                    | LT         | LT        |                           | R                     |           | LTR  |
| v (veh/h)                                        | 4                    | 18         | 17        |                           | 18                    |           | 20   |
| C (m) (veh/h)                                    | 585                  | 540        | 250       |                           | 716                   |           | 350  |
| v/c                                              | 0.01                 | 0.03       | 0.07      |                           | 0.03                  |           | 0.06 |
| 95% queue length                                 | 0.02                 | 0.10       | 0.22      |                           | 0.08                  |           | 0.18 |
| Control Delay (s/veh)                            | 11.2                 | 11.9       | 20.4      |                           | 10.2                  |           | 15.9 |
| LOS                                              | B                    | B          | C         |                           | B                     |           | C    |
| Approach Delay (s/veh)                           | --                   | --         |           |                           |                       |           |      |
| Approach LOS                                     | --                   | --         | C         |                           |                       | C         |      |

| TWO-WAY STOP CONTROL SUMMARY                     |                      |                   |                  |                           |                       |                  |      |
|--------------------------------------------------|----------------------|-------------------|------------------|---------------------------|-----------------------|------------------|------|
| <b>General Information</b>                       |                      |                   |                  | <b>Site Information</b>   |                       |                  |      |
| Analyst                                          | Reeve and Associates |                   |                  | Intersection              | Porter Lane and 400 W |                  |      |
| Agency/Co.                                       | Reeve and Associates |                   |                  | Jurisdiction              | Centerville           |                  |      |
| Date Performed                                   | 7/16/2015            |                   |                  | Analysis Year             | 2015                  |                  |      |
| Analysis Time Period                             | Peak Hour-Proposed   |                   |                  |                           |                       |                  |      |
| Project Description: Porter Walton Townhomes     |                      |                   |                  |                           |                       |                  |      |
| East/West Street: Porter Lane                    |                      |                   |                  | North/South Street: 400 W |                       |                  |      |
| Intersection Orientation: North-South            |                      |                   |                  | Study Period (hrs): 0.25  |                       |                  |      |
| <b>Vehicle Volumes and Adjustments</b>           |                      |                   |                  |                           |                       |                  |      |
| <b>Major Street</b>                              | <b>Northbound</b>    |                   |                  | <b>Southbound</b>         |                       |                  |      |
| Movement                                         | 1                    | 2                 | 3                | 4                         | 5                     | 6                |      |
|                                                  | L                    | T                 | R                | L                         | T                     | R                |      |
| Volume (veh/h)                                   | 4                    | 648               | 13               | 18                        | 610                   | 4                |      |
| Peak-Hour Factor, PHF                            |                      |                   |                  |                           |                       |                  |      |
| Hourly Flow Rate, HFR (veh/h)                    | 4                    | 648               | 13               | 18                        | 610                   | 4                |      |
| Percent Heavy Vehicles                           | 0                    | --                | --               | 0                         | --                    | --               |      |
| Median Type                                      | Undivided            |                   |                  |                           |                       |                  |      |
| RT Channelized                                   |                      |                   | 0                |                           |                       | 0                |      |
| Lanes                                            | 1                    | 1                 | 0                | 0                         | 1                     | 1                |      |
| Configuration                                    | L                    |                   | TR               | LT                        |                       | R                |      |
| Upstream Signal                                  |                      | 0                 |                  |                           | 0                     |                  |      |
| <b>Minor Street</b>                              | <b>Eastbound</b>     |                   |                  | <b>Westbound</b>          |                       |                  |      |
| Movement                                         | 7                    | 8                 | 9                | 10                        | 11                    | 12               |      |
|                                                  | L                    | T                 | R                | L                         | T                     | R                |      |
| Volume (veh/h)                                   | 7                    | 9                 | 9                | 11                        | 15                    | 18               |      |
| Peak-Hour Factor, PHF                            |                      |                   |                  |                           |                       |                  |      |
| Hourly Flow Rate, HFR (veh/h)                    | 7                    | 9                 | 9                | 11                        | 15                    | 18               |      |
| Percent Heavy Vehicles                           | 0                    | 0                 | 0                | 0                         | 0                     | 0                |      |
| Percent Grade (%)                                | 0                    |                   |                  | 0                         |                       |                  |      |
| Flared Approach                                  |                      | N                 |                  |                           | N                     |                  |      |
| Storage                                          |                      | 0                 |                  |                           | 0                     |                  |      |
| RT Channelized                                   |                      |                   | 0                |                           |                       | 0                |      |
| Lanes                                            | 0                    | 1                 | 0                | 0                         | 1                     | 1                |      |
| Configuration                                    |                      | LTR               |                  | LT                        |                       | R                |      |
| <b>Delay, Queue Length, and Level of Service</b> |                      |                   |                  |                           |                       |                  |      |
| <b>Approach</b>                                  | <b>Northbound</b>    | <b>Southbound</b> | <b>Westbound</b> |                           |                       | <b>Eastbound</b> |      |
| Movement                                         | 1                    | 4                 | 7                | 8                         | 9                     | 10               | 11   |
| Lane Configuration                               | L                    | LT                | LT               |                           | R                     |                  | LTR  |
| v (veh/h)                                        | 4                    | 18                | 26               |                           | 18                    |                  | 25   |
| C (m) (veh/h)                                    | 585                  | 540               | 204              |                           | 716                   |                  | 274  |
| v/c                                              | 0.01                 | 0.03              | 0.13             |                           | 0.03                  |                  | 0.09 |
| 95% queue length                                 | 0.02                 | 0.10              | 0.43             |                           | 0.08                  |                  | 0.30 |
| Control Delay (s/veh)                            | 11.2                 | 11.9              | 25.2             |                           | 10.2                  |                  | 19.5 |
| LOS                                              | B                    | B                 | D                |                           | B                     |                  | C    |
| Approach Delay (s/veh)                           | --                   | --                |                  |                           |                       |                  |      |
| Approach LOS                                     | --                   | --                | C                |                           |                       | C                |      |



## HCS 2010 Two Way Stop Intersections Release 6.40

Phone:  
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----- TWO-WAY STOP CONTROL(TWSC) ANALYSIS -----

Analyst: Reeve and Associates  
Agency/Co.: Reeve and Associate  
Date Performed: 7/2/2015  
Analysis Time Period: Peak Hour  
Intersection: Porter Lane and East Access  
Jurisdiction: Centerville  
Units: U. S. Customary  
Analysis Year: 2015  
Project ID: Porter Lane Townhomes  
East/West Street: East Access  
North/South Street: Porter Lane  
Intersection Orientation: 0

Study period (hrs):

|                        | Vehicle Volumes and Adjustments |      |      |               |      |      |
|------------------------|---------------------------------|------|------|---------------|------|------|
| Major Street Movements | 1                               | 2    | 3    | 4             | 5    | 6    |
|                        | L                               | T    | R    | L             | T    | R    |
| Volume                 | 4                               | 20   | 4    | 4             | 14   | 5    |
| Peak-Hour Factor, PHF  | 0.92                            | 0.92 | 0.92 | 0.92          | 0.92 | 0.92 |
| Peak-15 Minute Volume  | 1                               | 5    | 1    | 1             | 4    | 1    |
| Hourly Flow Rate, HFR  | 4                               | 21   | 4    | 4             | 15   | 5    |
| Percent Heavy Vehicles | 0                               | --   | --   | 0             | --   | --   |
| Median Type/Storage    | Raised curb                     |      |      | / Raised curb |      |      |
| RT Channelized?        |                                 |      |      |               |      |      |
| Lanes                  | 0                               | 1    | 0    | 0             | 1    | 0    |
| Configuration          |                                 |      |      |               |      |      |
| Upstream Signal?       | 0                               |      |      | 0             |      |      |

| Minor Street Movements           | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
|----------------------------------|--------|--------|--------|---------|---------|---------|
|                                  | L      | T      | R      | L       | T       | R       |
| Volume                           | 2      |        | 2      | 3       |         | 2       |
| Peak Hour Factor, PHF            | 0.92   |        | 0.92   | 0.92    |         | 0.92    |
| Peak-15 Minute Volume            | 1      |        | 1      | 1       |         | 1       |
| Hourly Flow Rate, HFR            | 2      |        | 2      | 3       |         | 2       |
| Percent Heavy Vehicles           | 0      |        | 0      | 0       |         | 0       |
| Percent Grade (%)                |        | 0      |        |         | 0       |         |
| Flared Approach: Exists?/Storage |        |        |        | /       |         | /       |
| RT Channelized?                  |        |        |        | No      |         | No      |
| Lanes                            | 1      |        | 1      | 1       |         | 1       |
| Configuration                    |        |        |        |         |         |         |

| Movements     | Pedestrian Volumes and Adjustments |    |    |    |
|---------------|------------------------------------|----|----|----|
|               | 13                                 | 14 | 15 | 16 |
| Flow (ped/hr) | 0                                  | 0  | 0  | 0  |

|                        |      |      |      |      |
|------------------------|------|------|------|------|
| Lane Width (ft)        | 12.0 | 12.0 | 12.0 | 12.0 |
| Walking Speed (ft/sec) | 4.0  | 4.0  | 4.0  | 4.0  |
| Percent Blockage       | 0.00 | 0.00 | 0.00 | 0.00 |

| Upstream Signal Data |                      |                    |                 |                      |                        |                       |                               |
|----------------------|----------------------|--------------------|-----------------|----------------------|------------------------|-----------------------|-------------------------------|
|                      | Prog.<br>Flow<br>vph | Sat<br>Flow<br>vph | Arrival<br>Type | Green<br>Time<br>sec | Cycle<br>Length<br>sec | Prog.<br>Speed<br>mph | Distance<br>to Signal<br>feet |
| S2 Left-Turn         |                      |                    |                 |                      |                        |                       |                               |
| Through              |                      |                    |                 |                      |                        |                       |                               |
| S5 Left-Turn         |                      |                    |                 |                      |                        |                       |                               |
| Through              |                      |                    |                 |                      |                        |                       |                               |

#### Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

|                                       | Movement 2 | Movement 5 |
|---------------------------------------|------------|------------|
| Shared ln volume, major th vehicles:  | 21         | 15         |
| Shared ln volume, major rt vehicles:  | 4          | 5          |
| Sat flow rate, major th vehicles:     | 1700       | 1700       |
| Sat flow rate, major rt vehicles:     | 1700       | 1700       |
| Number of major street through lanes: | 1          | 1          |

#### Worksheet 4-Critical Headway and Follow-up Headway Calculation

| Critical Headway Calculation |        |        |        |        |        |         |         |         |
|------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Movement                     | 1<br>L | 4<br>L | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
| t(c,base)NoStage             | 4.1    | 4.1    | -      | -      | 6.2    | -       | -       | 6.2     |
| t(c,base)Stage 1             | -      | -      | 6.1    | -      | -      | 6.1     | -       | -       |
| t(c,base)Stage 2             | -      | -      | 6.1    | -      | -      | 6.1     | -       | -       |
| t(c,hv)                      | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00    | 1.00    |
| P(hv)                        | 0      | 0      | 0      |        | 0      | 0       |         | 0       |
| t(c,g)                       |        |        | 0.20   | 0.20   | 0.10   | 0.20    | 0.20    | 0.10    |
| Percent Grade                |        |        | 0.00   | 0.00   | 0.00   | 0.00    | 0.00    | 0.00    |
| t(3,lt)                      | 0.00   | 0.00   | 0.00   |        | 0.00   | 0.00    |         | 0.00    |
| t(c,T): 1-stage              | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00    | 0.00    | 0.00    |
| 2-stage                      | 0.00   | 0.00   | 1.00   | 1.00   | 0.00   | 1.00    | 1.00    | 0.00    |
| t(c) 1-stage                 | 4.1    | 4.1    | 7.1    |        | 6.2    | 7.1     |         | 6.2     |
| 2-stage                      | 0.0    | 0.0    | 6.1    |        | 6.2    | 6.1     |         | 6.2     |

| Follow-Up Headway Calculations |        |        |        |        |        |         |         |         |
|--------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Movement                       | 1<br>L | 4<br>L | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
| t(f,base)                      | 2.20   | 2.20   | 3.50   |        | 3.30   | 3.50    |         | 3.30    |
| t(f,HV)                        | 0.90   | 0.90   | 0.90   | 0.90   | 0.90   | 0.90    | 0.90    | 0.90    |
| P(HV)                          | 0      | 0      | 0      |        | 0      | 0       |         | 0       |
| t(f)                           | 2.2    | 2.2    | 3.5    |        | 3.3    | 3.5     |         | 3.3     |

#### Worksheet 5-Effect of Upstream Signals

| Computation 1-Queue Clearance Time at Upstream Signal |            |           |            |           |
|-------------------------------------------------------|------------|-----------|------------|-----------|
|                                                       | Movement 2 |           | Movement 5 |           |
|                                                       | V(t)       | V(l,prot) | V(t)       | V(l,prot) |

---

V prog  
 Total Saturation Flow Rate, s (vph)  
 Arrival Type  
 Effective Green, g (sec)  
 Cycle Length, C (sec)  
 Rp (from Exhibit 16-11)  
 Proportion vehicles arriving on green P  
 g(q1)  
 g(q2)  
 g(q)

---

Computation 2-Proportion of TWSC Intersection Time blocked

|  | Movement 2 |           | Movement 5 |           |
|--|------------|-----------|------------|-----------|
|  | V(t)       | V(l,prot) | V(t)       | V(l,prot) |

---

alpha  
 beta  
 Travel time, t(a) (sec)  
 Smoothing Factor, F  
 Proportion of conflicting flow, f  
 Max platooned flow, V(c,max)  
 Min platooned flow, V(c,min)  
 Duration of blocked period, t(p)  
 Proportion time blocked, p

|  |       |       |
|--|-------|-------|
|  | 0.000 | 0.000 |
|--|-------|-------|

---

Computation 3-Platoon Event Periods      Result

---

|                               |       |
|-------------------------------|-------|
| p(2)                          | 0.000 |
| p(5)                          | 0.000 |
| p(dom)                        |       |
| p(subo)                       |       |
| Constrained or unconstrained? |       |

---

| Proportion<br>unblocked<br>for minor<br>movements, p(x) | (1)<br>Single-stage<br>Process | (2)<br>Two-Stage Process<br>Stage I | (3)<br>Process<br>Stage II |
|---------------------------------------------------------|--------------------------------|-------------------------------------|----------------------------|
|---------------------------------------------------------|--------------------------------|-------------------------------------|----------------------------|

---

p(1)  
 p(4)  
 p(7)  
 p(8)  
 p(9)  
 p(10)  
 p(11)  
 p(12)

---

Computation 4 and 5  
 Single-Stage Process

| Movement | 1 | 4 | 7 | 8 | 9 | 10 | 11 | 12 |
|----------|---|---|---|---|---|----|----|----|
|          | L | L | L | T | R | L  | T  | R  |

---

|           |    |    |    |  |    |    |  |    |
|-----------|----|----|----|--|----|----|--|----|
| V c, x    | 20 | 25 | 57 |  | 23 | 57 |  | 18 |
| s         |    |    |    |  |    |    |  |    |
| Px        |    |    |    |  |    |    |  |    |
| V c, u, x |    |    |    |  |    |    |  |    |

---

C r, x  
 C plat, x

---

## Two-Stage Process

|           | 7      |        | 8      |        | 10     |        | 11     |        |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|
|           | Stage1 | Stage2 | Stage1 | Stage2 | Stage1 | Stage2 | Stage1 | Stage2 |
| V(c,x)    | 31     | 26     |        |        | 26     | 31     |        |        |
| s         |        | 1500   |        |        |        | 1500   |        |        |
| P(x)      |        |        |        |        |        |        |        |        |
| V(c,u,x)  |        |        |        |        |        |        |        |        |
| C(r,x)    |        |        |        |        |        |        |        |        |
| C(plat,x) |        |        |        |        |        |        |        |        |

## Worksheet 6-Impedance and Capacity Equations

|                                        |      |      |
|----------------------------------------|------|------|
| Step 1: RT from Minor St.              | 9    | 12   |
| Conflicting Flows                      | 23   | 18   |
| Potential Capacity                     | 1060 | 1066 |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Movement Capacity                      | 1060 | 1066 |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Step 2: LT from Major St.              | 4    | 1    |
| Conflicting Flows                      | 25   | 20   |
| Potential Capacity                     | 1603 | 1609 |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Movement Capacity                      | 1603 | 1609 |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Maj L-Shared Prob Q free St.           | 1.00 | 1.00 |
| Step 3: TH from Minor St.              | 8    | 11   |
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      |      |      |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Step 4: LT from Minor St.              | 7    | 10   |
| Conflicting Flows                      | 57   | 57   |
| Potential Capacity                     | 945  | 945  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Maj. L, Min T Impedance factor         | 1.00 | 1.00 |
| Maj. L, Min T Adj. Imp Factor.         | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 0.99 | 1.00 |
| Movement Capacity                      | 939  | 939  |

## Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

|                                        |      |      |
|----------------------------------------|------|------|
| Step 3: TH from Minor St.              | 8    | 11   |
| Part 1 - First Stage                   |      |      |
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |

Movement Capacity  
Probability of Queue free St.

---

Part 2 - Second Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      |      |      |
| Potential Capacity                     | 914  | 917  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      | 912  | 915  |

---

Part 3 - Single Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      |      |      |

---

Result for 2 stage process:

|                               |      |      |
|-------------------------------|------|------|
| a                             | 0.91 | 0.91 |
| y                             |      |      |
| C t                           |      |      |
| Probability of Queue free St. | 1.00 | 1.00 |

---

|                           |   |    |
|---------------------------|---|----|
| Step 4: LT from Minor St. | 7 | 10 |
|---------------------------|---|----|

---

Part 1 - First Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 31   | 26   |
| Potential Capacity                     | 991  | 997  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      | 989  | 995  |

---

Part 2 - Second Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 26   | 31   |
| Potential Capacity                     | 997  | 991  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt |      |      |
| Movement Capacity                      |      |      |

---

Part 3 - Single Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 57   | 57   |
| Potential Capacity                     | 945  | 945  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Maj. L, Min T Impedance factor         | 1.00 | 1.00 |
| Maj. L, Min T Adj. Imp Factor.         | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 0.99 | 0.99 |
| Movement Capacity                      | 939  | 939  |

---

Results for Two-stage process:

|     |      |      |
|-----|------|------|
| a   | 0.91 | 0.91 |
| y   |      |      |
| C t |      |      |

---

Worksheet 8-Shared Lane Calculations

---

|                         |   |   |      |    |    |      |
|-------------------------|---|---|------|----|----|------|
| Movement                | 7 | 8 | 9    | 10 | 11 | 12   |
|                         | L | T | R    | L  | T  | R    |
| Volume (vph)            | 2 |   | 2    | 3  |    | 2    |
| Movement Capacity (vph) |   |   | 1060 |    |    | 1066 |

# Shared Lane Capacity (vph)

## Worksheet 9-Computation of Effect of Flared Minor Street Approaches

| Movement        | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
|-----------------|--------|--------|--------|---------|---------|---------|
| C sep           |        |        | 1060   |         |         | 1066    |
| Volume          | 2      |        | 2      | 3       |         | 2       |
| Delay           |        |        |        |         |         |         |
| Q sep           |        |        |        |         |         |         |
| Q sep +1        |        |        |        |         |         |         |
| round (Qsep +1) |        |        |        |         |         |         |
| n max           |        |        |        |         |         |         |
| C sh            |        |        |        |         |         |         |
| SUM C sep       |        |        |        |         |         |         |
| n               |        |        |        |         |         |         |
| C act           |        |        |        |         |         |         |

## Worksheet 10-Delay, Queue Length, and Level of Service

| Movement         | 1    | 4    | 7 | 8   | 9    | 10 | 11  | 12   |
|------------------|------|------|---|-----|------|----|-----|------|
| Lane Config      | LTR  | LTR  | L |     | R    | L  |     | R    |
| v (vph)          | 4    | 4    | 2 |     | 2    | 3  |     | 2    |
| C(m) (vph)       | 1609 | 1603 |   |     | 1060 |    |     | 1066 |
| v/c              | 0.00 | 0.00 |   |     | 0.00 |    |     | 0.00 |
| 95% queue length | 0.01 | 0.01 |   |     | 0.01 |    |     | 0.01 |
| Control Delay    | 7.2  | 7.3  |   |     | 8.4  |    |     | 8.4  |
| LOS              | A    | A    |   |     | A    |    |     | A    |
| Approach Delay   |      |      |   | 8.4 |      |    | 8.4 |      |
| Approach LOS     |      |      |   |     |      |    |     |      |

## Worksheet 11-Shared Major LT Impedance and Delay

|                                               | Movement 2 | Movement 5 |
|-----------------------------------------------|------------|------------|
| p(oj)                                         | 1.00       | 1.00       |
| v(i1), Volume for stream 2 or 5               | 21         | 15         |
| v(i2), Volume for stream 3 or 6               | 4          | 5          |
| s(i1), Saturation flow rate for stream 2 or 5 | 1700       | 1700       |
| s(i2), Saturation flow rate for stream 3 or 6 | 1700       | 1700       |
| P*(oj)                                        | 1.00       | 1.00       |
| d(M,LT), Delay for stream 1 or 4              | 7.2        | 7.3        |
| N, Number of major street through lanes       | 1          | 1          |
| d(rank,1) Delay for stream 2 or 5             | 0.0        | 0.0        |



## HCS 2010 Two Way Stop Intersections Release 6.40

Phone:  
E-Mail:

Fax:

----- TWO-WAY STOP CONTROL (TWSC) ANALYSIS -----

Analyst: Reeve and Associates  
Agency/Co.: Reeve and Associate  
Date Performed: 7/2/2015  
Analysis Time Period: Peak Hour  
Intersection: Porter Lane and West Access  
Jurisdiction: Centerville  
Units: U. S. Customary  
Analysis Year: 2015  
Project ID: Porter Lane Townhomes  
East/West Street: West Access  
North/South Street: Porter Lane  
Intersection Orientation: 0

Study period (hrs):

| Vehicle Volumes and Adjustments  |             |        |        |               |         |         |
|----------------------------------|-------------|--------|--------|---------------|---------|---------|
| Major Street Movements           | 1<br>L      | 2<br>T | 3<br>R | 4<br>L        | 5<br>T  | 6<br>R  |
| Volume                           | 4           | 24     | 4      | 4             | 10      | 4       |
| Peak-Hour Factor, PHF            | 0.92        | 0.92   | 0.92   | 0.92          | 0.92    | 0.92    |
| Peak-15 Minute Volume            | 1           | 7      | 1      | 1             | 3       | 1       |
| Hourly Flow Rate, HFR            | 4           | 26     | 4      | 4             | 10      | 4       |
| Percent Heavy Vehicles           | 0           | --     | --     | 0             | --      | --      |
| Median Type/Storage              | Raised curb |        |        | / Raised curb |         |         |
| RT Channelized?                  |             |        |        |               |         |         |
| Lanes                            | 0           | 1      | 0      | 0             | 1       | 0       |
| Configuration                    |             |        |        |               |         |         |
| Upstream Signal?                 |             | 0      |        |               | 0       |         |
| Minor Street Movements           | 7<br>L      | 8<br>T | 9<br>R | 10<br>L       | 11<br>T | 12<br>R |
| Volume                           | 2           |        | 2      | 2             |         | 2       |
| Peak Hour Factor, PHF            | 0.92        |        | 0.92   | 0.92          |         | 0.92    |
| Peak-15 Minute Volume            | 1           |        | 1      | 1             |         | 1       |
| Hourly Flow Rate, HFR            | 2           |        | 2      | 2             |         | 2       |
| Percent Heavy Vehicles           | 0           |        | 0      | 0             |         | 0       |
| Percent Grade (%)                |             | 0      |        |               | 0       |         |
| Flared Approach: Exists?/Storage |             |        |        | /             |         | /       |
| RT Channelized?                  |             |        | No     |               |         | No      |
| Lanes                            | 1           |        | 1      | 1             |         | 1       |
| Configuration                    |             |        |        |               |         |         |

| Pedestrian Volumes and Adjustments |    |    |    |    |
|------------------------------------|----|----|----|----|
| Movements                          | 13 | 14 | 15 | 16 |
| Flow (ped/hr)                      | 0  | 0  | 0  | 0  |

|                        |      |      |      |      |
|------------------------|------|------|------|------|
| Lane Width (ft)        | 12.0 | 12.0 | 12.0 | 12.0 |
| Walking Speed (ft/sec) | 4.0  | 4.0  | 4.0  | 4.0  |
| Percent Blockage       | 0.00 | 0.00 | 0.00 | 0.00 |

| Upstream Signal Data    |                      |                    |                 |                      |                        |                       |                               |
|-------------------------|----------------------|--------------------|-----------------|----------------------|------------------------|-----------------------|-------------------------------|
|                         | Prog.<br>Flow<br>vph | Sat<br>Flow<br>vph | Arrival<br>Type | Green<br>Time<br>sec | Cycle<br>Length<br>sec | Prog.<br>Speed<br>mph | Distance<br>to Signal<br>feet |
| S2 Left-Turn<br>Through |                      |                    |                 |                      |                        |                       |                               |
| S5 Left-Turn<br>Through |                      |                    |                 |                      |                        |                       |                               |

Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles

|                                       | Movement 2 | Movement 5 |
|---------------------------------------|------------|------------|
| Shared ln volume, major th vehicles:  | 26         | 10         |
| Shared ln volume, major rt vehicles:  | 4          | 4          |
| Sat flow rate, major th vehicles:     | 1700       | 1700       |
| Sat flow rate, major rt vehicles:     | 1700       | 1700       |
| Number of major street through lanes: | 1          | 1          |

Worksheet 4-Critical Headway and Follow-up Headway Calculation

| Critical Headway Calculation |        |        |        |        |        |         |         |         |
|------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Movement                     | 1<br>L | 4<br>L | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
| t(c,base)NoStage             | 4.1    | 4.1    | -      | -      | 6.2    | -       | -       | 6.2     |
| t(c,base)Stage 1             | -      | -      | 6.1    | -      | -      | 6.1     | -       | -       |
| t(c,base)Stage 2             | -      | -      | 6.1    | -      | -      | 6.1     | -       | -       |
| t(c,hv)                      | 1.00   | 1.00   | 1.00   | 1.00   | 1.00   | 1.00    | 1.00    | 1.00    |
| P(hv)                        | 0      | 0      | 0      |        | 0      | 0       |         | 0       |
| t(c,g)                       |        |        | 0.20   | 0.20   | 0.10   | 0.20    | 0.20    | 0.10    |
| Percent Grade                |        |        | 0.00   | 0.00   | 0.00   | 0.00    | 0.00    | 0.00    |
| t(3,lt)                      | 0.00   | 0.00   | 0.00   |        | 0.00   | 0.00    |         | 0.00    |
| t(c,T): 1-stage              | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00    | 0.00    | 0.00    |
| 2-stage                      | 0.00   | 0.00   | 1.00   | 1.00   | 0.00   | 1.00    | 1.00    | 0.00    |
| t(c) 1-stage                 | 4.1    | 4.1    | 7.1    |        | 6.2    | 7.1     |         | 6.2     |
| 2-stage                      | 0.0    | 0.0    | 6.1    |        | 6.2    | 6.1     |         | 6.2     |

| Follow-Up Headway Calculations |        |        |        |        |        |         |         |         |
|--------------------------------|--------|--------|--------|--------|--------|---------|---------|---------|
| Movement                       | 1<br>L | 4<br>L | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
| t(f,base)                      | 2.20   | 2.20   | 3.50   |        | 3.30   | 3.50    |         | 3.30    |
| t(f,HV)                        | 0.90   | 0.90   | 0.90   | 0.90   | 0.90   | 0.90    | 0.90    | 0.90    |
| P(HV)                          | 0      | 0      | 0      |        | 0      | 0       |         | 0       |
| t(f)                           | 2.2    | 2.2    | 3.5    |        | 3.3    | 3.5     |         | 3.3     |

Worksheet 5-Effect of Upstream Signals

| Computation 1-Queue Clearance Time at Upstream Signal |            |           |            |           |
|-------------------------------------------------------|------------|-----------|------------|-----------|
|                                                       | Movement 2 |           | Movement 5 |           |
|                                                       | V(t)       | V(l,prot) | V(t)       | V(l,prot) |

V prog  
 Total Saturation Flow Rate, s (vph)  
 Arrival Type  
 Effective Green, g (sec)  
 Cycle Length, C (sec)  
 Rp (from Exhibit 16-11)  
 Proportion vehicles arriving on green P  
 g(q1)  
 g(q2)  
 g(q)

---

Computation 2-Proportion of TWSC Intersection Time blocked

|  | Movement 2 |           | Movement 5 |           |
|--|------------|-----------|------------|-----------|
|  | V(t)       | V(l,prot) | V(t)       | V(l,prot) |

---

|                                   |  |       |  |       |
|-----------------------------------|--|-------|--|-------|
| alpha                             |  |       |  |       |
| beta                              |  |       |  |       |
| Travel time, t(a) (sec)           |  |       |  |       |
| Smoothing Factor, F               |  |       |  |       |
| Proportion of conflicting flow, f |  |       |  |       |
| Max platooned flow, V(c,max)      |  |       |  |       |
| Min platooned flow, V(c,min)      |  |       |  |       |
| Duration of blocked period, t(p)  |  |       |  |       |
| Proportion time blocked, p        |  | 0.000 |  | 0.000 |

---

Computation 3-Platoon Event Periods      Result

---

|                               |       |
|-------------------------------|-------|
| p(2)                          | 0.000 |
| p(5)                          | 0.000 |
| p(dom)                        |       |
| p(subo)                       |       |
| Constrained or unconstrained? |       |

---

| Proportion<br>unblocked<br>for minor<br>movements, p(x) | (1)<br>Single-stage<br>Process | (2)<br>Two-Stage<br>Stage I | (3)<br>Process<br>Stage II |
|---------------------------------------------------------|--------------------------------|-----------------------------|----------------------------|
|---------------------------------------------------------|--------------------------------|-----------------------------|----------------------------|

---

p(1)  
 p(4)  
 p(7)  
 p(8)  
 p(9)  
 p(10)  
 p(11)  
 p(12)

---

Computation 4 and 5  
 Single-Stage Process

| Movement | 1 | 4 | 7 | 8 | 9 | 10 | 11 | 12 |
|----------|---|---|---|---|---|----|----|----|
|          | L | L | L | T | R | L  | T  | R  |

---

|        |    |    |    |  |    |    |  |    |
|--------|----|----|----|--|----|----|--|----|
| V c, x | 14 | 30 | 56 |  | 28 | 56 |  | 12 |
|--------|----|----|----|--|----|----|--|----|

s  
 Px  
 V c, u, x

---

C r, x  
 C plat, x

---

## Two-Stage Process

|           | 7      |        | 8      |        | 10     |        | 11     |        |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|
|           | Stage1 | Stage2 | Stage1 | Stage2 | Stage1 | Stage2 | Stage1 | Stage2 |
| V(c,x)    | 36     | 20     |        |        | 20     | 36     |        |        |
| s         |        | 1500   |        |        |        | 1500   |        |        |
| P(x)      |        |        |        |        |        |        |        |        |
| V(c,u,x)  |        |        |        |        |        |        |        |        |
| C(r,x)    |        |        |        |        |        |        |        |        |
| C(plat,x) |        |        |        |        |        |        |        |        |

## Worksheet 6-Impedance and Capacity Equations

|                                        |      |      |
|----------------------------------------|------|------|
| Step 1: RT from Minor St.              | 9    | 12   |
| Conflicting Flows                      | 28   | 12   |
| Potential Capacity                     | 1053 | 1074 |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Movement Capacity                      | 1053 | 1074 |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Step 2: LT from Major St.              | 4    | 1    |
| Conflicting Flows                      | 30   | 14   |
| Potential Capacity                     | 1596 | 1617 |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Movement Capacity                      | 1596 | 1617 |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Maj L-Shared Prob Q free St.           | 1.00 | 1.00 |
| Step 3: TH from Minor St.              | 8    | 11   |
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      |      |      |
| Probability of Queue free St.          | 1.00 | 1.00 |
| Step 4: LT from Minor St.              | 7    | 10   |
| Conflicting Flows                      | 56   | 56   |
| Potential Capacity                     | 946  | 946  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Maj. L, Min T Impedance factor         | 1.00 | 1.00 |
| Maj. L, Min T Adj. Imp Factor.         | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 0.99 | 1.00 |
| Movement Capacity                      | 940  | 940  |

## Worksheet 7-Computation of the Effect of Two-stage Gap Acceptance

|                                        |      |      |
|----------------------------------------|------|------|
| Step 3: TH from Minor St.              | 8    | 11   |
| Part 1 - First Stage                   |      |      |
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |

Movement Capacity  
Probability of Queue free St.

---

Part 2 - Second Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      |      |      |
| Potential Capacity                     | 911  | 919  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      | 909  | 917  |

---

Part 3 - Single Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      |      |      |
| Potential Capacity                     |      |      |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      |      |      |

---

Result for 2 stage process:

|                               |      |      |
|-------------------------------|------|------|
| a                             | 0.91 | 0.91 |
| y                             |      |      |
| C t                           |      |      |
| Probability of Queue free St. | 1.00 | 1.00 |

---

|                           |   |    |
|---------------------------|---|----|
| Step 4: LT from Minor St. | 7 | 10 |
|---------------------------|---|----|

---

Part 1 - First Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 36   | 20   |
| Potential Capacity                     | 985  | 1004 |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 1.00 | 1.00 |
| Movement Capacity                      | 983  | 1001 |

---

Part 2 - Second Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 20   | 36   |
| Potential Capacity                     | 1004 | 985  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt |      |      |
| Movement Capacity                      |      |      |

---

Part 3 - Single Stage

|                                        |      |      |
|----------------------------------------|------|------|
| Conflicting Flows                      | 56   | 56   |
| Potential Capacity                     | 946  | 946  |
| Pedestrian Impedance Factor            | 1.00 | 1.00 |
| Maj. L, Min T Impedance factor         | 1.00 | 1.00 |
| Maj. L, Min T Adj. Imp Factor.         | 1.00 | 1.00 |
| Cap. Adj. factor due to Impeding mvmnt | 0.99 | 0.99 |
| Movement Capacity                      | 940  | 940  |

---

Results for Two-stage process:

|     |      |      |
|-----|------|------|
| a   | 0.91 | 0.91 |
| y   |      |      |
| C t |      |      |

---

Worksheet 8-Shared Lane Calculations

|                         |   |   |      |    |    |      |
|-------------------------|---|---|------|----|----|------|
| Movement                | 7 | 8 | 9    | 10 | 11 | 12   |
|                         | L | T | R    | L  | T  | R    |
| Volume (vph)            | 2 |   | 2    | 2  |    | 2    |
| Movement Capacity (vph) |   |   | 1053 |    |    | 1074 |

Shared Lane Capacity (vph)

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

| Movement        | 7<br>L | 8<br>T | 9<br>R | 10<br>L | 11<br>T | 12<br>R |
|-----------------|--------|--------|--------|---------|---------|---------|
| C sep           |        |        | 1053   |         |         | 1074    |
| Volume          | 2      |        | 2      | 2       |         | 2       |
| Delay           |        |        |        |         |         |         |
| Q sep           |        |        |        |         |         |         |
| Q sep +1        |        |        |        |         |         |         |
| round (Qsep +1) |        |        |        |         |         |         |
| n max           |        |        |        |         |         |         |
| C sh            |        |        |        |         |         |         |
| SUM C sep       |        |        |        |         |         |         |
| n               |        |        |        |         |         |         |
| C act           |        |        |        |         |         |         |

Worksheet 10-Delay, Queue Length, and Level of Service

| Movement         | 1    | 4    | 7 | 8   | 9    | 10 | 11  | 12   |
|------------------|------|------|---|-----|------|----|-----|------|
| Lane Config      | LTR  | LTR  | L |     | R    | L  |     | R    |
| v (vph)          | 4    | 4    | 2 |     | 2    | 2  |     | 2    |
| C(m) (vph)       | 1617 | 1596 |   |     | 1053 |    |     | 1074 |
| v/c              | 0.00 | 0.00 |   |     | 0.00 |    |     | 0.00 |
| 95% queue length | 0.01 | 0.01 |   |     | 0.01 |    |     | 0.01 |
| Control Delay    | 7.2  | 7.3  |   |     | 8.4  |    |     | 8.4  |
| LOS              | A    | A    |   |     | A    |    |     | A    |
| Approach Delay   |      |      |   | 8.4 |      |    | 8.4 |      |
| Approach LOS     |      |      |   |     |      |    |     |      |

Worksheet 11-Shared Major LT Impedance and Delay

|                                               | Movement 2 | Movement 5 |
|-----------------------------------------------|------------|------------|
| p(oj)                                         | 1.00       | 1.00       |
| v(i1), Volume for stream 2 or 5               | 26         | 10         |
| v(i2), Volume for stream 3 or 6               | 4          | 4          |
| s(i1), Saturation flow rate for stream 2 or 5 | 1700       | 1700       |
| s(i2), Saturation flow rate for stream 3 or 6 | 1700       | 1700       |
| P*(oj)                                        | 1.00       | 1.00       |
| d(M,LT), Delay for stream 1 or 4              | 7.2        | 7.3        |
| N, Number of major street through lanes       | 1          | 1          |
| d(rank,1) Delay for stream 2 or 5             | 0.0        | 0.0        |



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**Reeve & Associates, Inc.**

920 Chambers St., Ste. 14  
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[www.reeve-assoc.com](http://www.reeve-assoc.com)  
[ogden@reeve-assoc.com](mailto:ogden@reeve-assoc.com)

Land Planning

Project Feasibility

Site Acquisition

Civil Engineering

Traffic Engineering

Structural Engineering

Land Surveying

Landscape Architecture

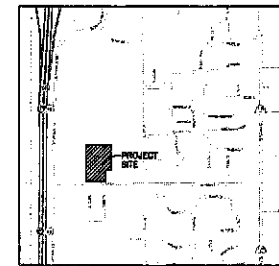
Construction Services

Project Management

# PORTER WALTON TOWNHOMES P.R.U.D.

## Improvement Plans

CENTERVILLE, DAVIS COUNTY, UTAH  
JULY, 2015



Vicinity Map  
NOT TO SCALE

675 West

600 West

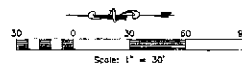
400 South Street (Porter Lane)

### Sheet Index

- Sheet 1 - Cover/Index Sheet
- Sheet 2 - Notes/Legend/Street Cross-Section
- Sheet 3 - Existing Site Plan
- Sheet 4 - Proposed Site Plan
- Sheet 5 - Proposed Grading & Drainage Plan
- Sheet 6 - Proposed Utility Plan
- Sheet 7 - Utility Profile
- Sheet 8 - Civil Details
- Sheet 9 - Storm Water Pollution Prevention Plan Exhibit
- Sheet 10 - Storm Water Pollution Prevention Plan Details
- Sheet L1 - Landscape Plan
- Sheet L2 - Landscape Plan
- Sheet L3 - Landscape Details

### Design Data

TOTAL AREA.....6.16 ACRES  
UNITS 1-46.....1.86 ACRES (26.95%)  
LOT 47.....0.57 ACRES (9.25%)  
ROADWAY & PARKING.....0.82 ACRES (13.31%)  
COMMON/UNIMATED COMMON.....3.11 ACRES (50.49%)



### Engineer's Notice To Contractors

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED FROM AVAILABLE INFORMATION PROVIDED BY OTHERS. THE LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTOR, SO THAT ANY NECESSARY ADJUSTMENTS CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENT. THE CONTRACTOR IS REQUIRED TO CONTACT THE UTILITY COMPANIES AND TAKE THE PRECAUTIONARY MEASURE TO PROTECT ANY UTILITY LINES SHOWN, AND ANY OTHER LINES DERIVED BY THE CONTRACTOR'S RESEARCH, AND OTHERS NOT OF RECORD OR NOT SHOWN ON THESE PLANS.

### Developer Contact:

Brighton Homes Utah, L.L.C.  
215 North Redwood Road, Suite 5  
North Salt Lake City, Utah, 84054  
PH: (801) 392-9755

Blue Stakes Location Center

Call Toll Free  
1-800-682-4111

Two Working Days Before You Dig



| REVISIONS | DESCRIPTION |
|-----------|-------------|
| DATE      |             |

Porter Walton Townhomes  
CENTERVILLE CITY, DAVIS COUNTY, UTAH  
Existing Site Plan/  
Demolition Plan



Project Info:  
Engineer:  
J. HILL, P.E.  
Date:  
JULY 22, 2015  
Name:  
PORTER WALTON  
TOWNHOMES

Number: 6445-02

Sheet  
1 of 13  
Sheets

Revised: 7-15-15

### Master Legend

- |        |                                  |        |                                   |
|--------|----------------------------------|--------|-----------------------------------|
| A      | • EXISTING CATCH BASIN           | 1.F.   | • LINER PATE                      |
| B      | • EXISTING FRANKLINER            | NO     | • NATURAL GRADE                   |
| C      | • PLUG W/ F. BLOW-OFF            | O.C.   | • ON CENTER                       |
| D      | • AIR-WALL ASSEMBLY              | PC     | • POINT OF CURVE                  |
| E      | • PROPOSED REDUCER               | PVC    | • POINT OF REVERSE CURVE          |
| F      | • PLUG & BLOCK                   | PWMC   | • POINT OF REVERSE VERTICAL CURVE |
| G      | • STREET LIGHT                   | TT     | • POINT OF TANGENT                |
| H      | • SIGN                           | PP     | • POWER/SPLITTY POLE              |
| I      | • BUILDING                       | P.U.L. | • PUBLIC UTILITY EQUIPMENT        |
| B/C    | • BEGIN VERTICAL CURVE           | R/C    | • REBAR & CAP                     |
| C/B    | • CURB & GUTTER                  | R/CB   | • REINFORCED CONCRETE BOX         |
| C/C    | • CATCH BASIN                    | R/CP   | • REINFORCED CONCRETE PIPE        |
| D.F.   | • CURB FRET                      | RM     | • RIM OF MANHOLE                  |
| C.F.S. | • CURB FRET PER SECOND           | SD     | • RIGHT-OF-WAY                    |
| C/L    | • CENTERLINE                     | ST     | • STORM DRAIN                     |
| D      | • DUCTILE IRON                   | ST     | • MANHOLE SEWER                   |
| DI     | • EDGE OF PAVEMENT               | SW     | • SECONDARY WATER                 |
| EVC    | • END VERTICAL CURVE             | TEC    | • TOP JACK OF CURB                |
| F      | • FRENCH CURBING                 | TS     | • TRUE OF SLOPE                   |
| F      | • FINISH FLOOR                   | TOP    | • TOP OF SLOPE                    |
| FF     | • FINISH FLOOR ELEVATION         | TOP    | • TOP OF WALL                     |
| F      | • FINISHED GRADE                 | TSW    | • TOP OF SIDEWALK                 |
| FM     | • FLEX STRENGTH                  | VM     | • VERTICAL POINT OF INTERSECT.    |
| F      | • FLOW LINE                      | W      | • CULINARY WATER                  |
| OS     | • GRADE BREAK                    | W4     | • WATER METER                     |
| HDP    | • HIGH DENSITY POLYETHYLENE PIPE |        | • NEW PAVEMENT                    |
| INVT   | • INVERT                         |        | • NEW CONCRETE                    |
| IS     | • IRRIGATION                     |        |                                   |
| LD     | • LAND DRAIN                     |        |                                   |

### Typical Private Lane Section

[illegible]

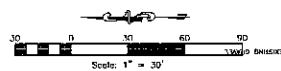
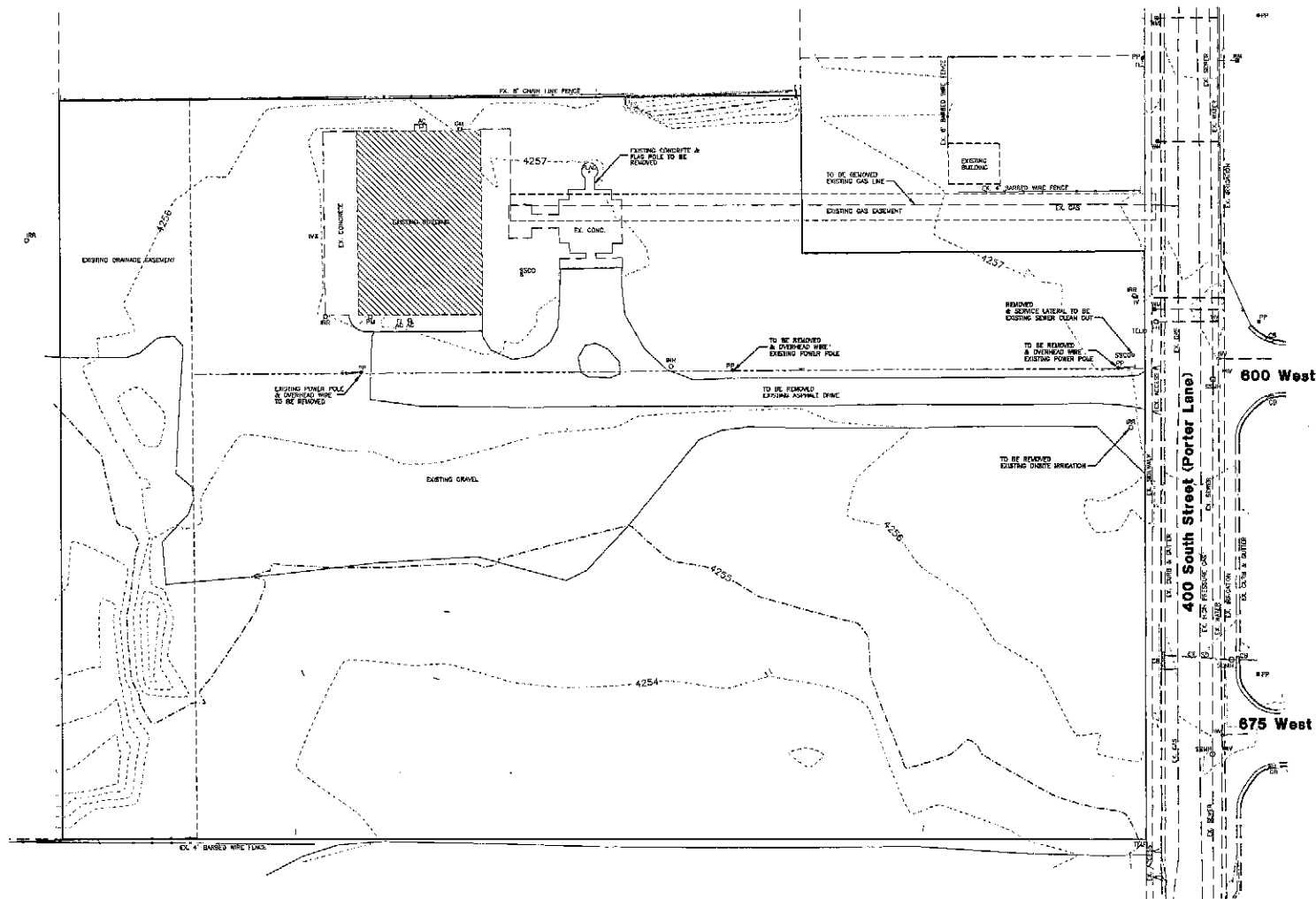
SCALE: NONE

SCALE: NONE

5. WATER LINE PIPE SHALL BE C-900 DR14 PVC  
ALL CULINARY WATERLINE CONSTRUCTION SHALL  
MEET IMPROVEMENT DISTRICT STANDARDS AND
6. FIRE HYDRANTS ARE TO BE CLOW OR MUELLER.
7. SANITARY SEWER LATERALS SHALL HAVE 10 TAPE  
BEYOND END OF LATERAL.

**Notes/Legend/  
Street Cross-Section**

|       |        |
|-------|--------|
| Sheet | 13     |
| 2     | Sheets |



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Revised: 7-15-15

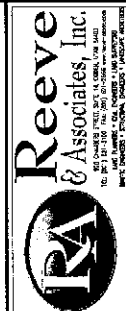
**Porter Walton Townhomes**  
CENTRALE CITY, DAVIS COUNTY, UTAH

**Existing Site Plan/  
Demolition Plan**



**Project Info**  
Engineer: J. SCOTT REEVE, P.E.  
Draftsman: BOCHIE  
Begin Date: JUNE 22, 2015  
Name: PORTER WALTON TOWNHOMES  
Number: 0440-02

Sheet **3** of **13**  
Sheets



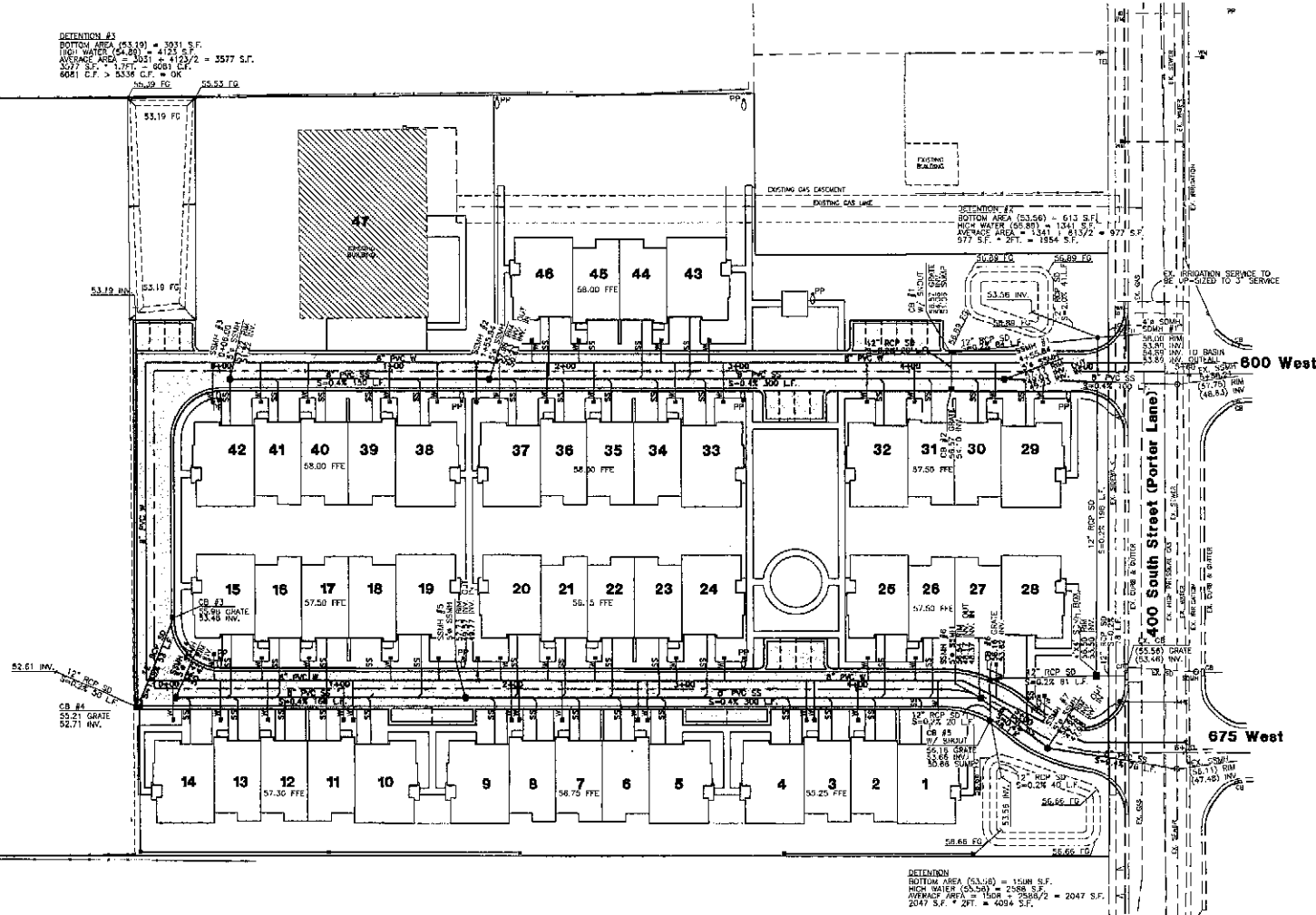
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|      |          |             |
|      |          |             |

829 CHAMBERS STREET #14, OGDEN, UTAH 84403  
TEL: 435-771-1111 FAX: 435-771-1112  
WWW.REEVE-ASSOCIATES.COM  
REVE & ASSOCIATES, INC. ENGINEERS & ARCHITECTS





DETENTION #3  
BOTTOM AREA (53.19) = 3031 S.F.  
HIGH WATER (54.80) = 4123 S.F.  
AVERAGE AREA = 3581 S.F.  $\times 2/2 = 3577$  S.F.  
3077 S.F.  $\times 1.761 = 6081$  C.F.  
6081 C.F.  $\times 5.536$  C.F. = 3377 S.F.



DETENTION  
BOTTOM AREA (53.19) = 1508 S.F.  
HIGH WATER (54.80) = 2388 S.F.  
AVERAGE AREA = 1948 S.F.  $\times 2/2 = 2047$  S.F.  
2047 S.F.  $\times 2.91 = 6004$  C.F.

Scale: 1" = 30'

### Construction Notes:

- 1) ALL CONSTRUCTION IS TO CONFORM TO THE STANDARD DRAWINGS AND SPECIFICATIONS OF ILLINOIS CITY.
- 2) CONSTRUCT HANDICAP RAMP PER ADA AND CITY REQUIREMENTS.

#### CULINARY WATER

W/8 - 8" C-900 DR14 PVC WATER LINE

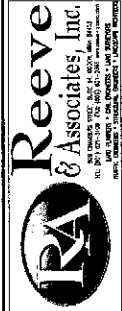
#### SANITARY SEWER

SS/8 - 8" PVC ASTM 3034 SEWER LINE

#### STORM DRAIN

SD/15 - 15" WSP STORM DRAIN

NOTE:  
1. ALL EXISTING SEWER AND CULINARY WATER LATERALS ARE TO BE DISCONNECTED AT THE MAIN.  
2. FIELD VERIFY DEPTH OF THE EX. 20" HIGH PRESSURE GAS AND PROVIDE REQUIRED CLEARANCE FROM NEW SAND.



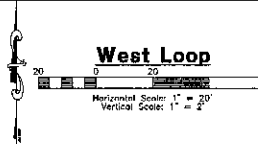
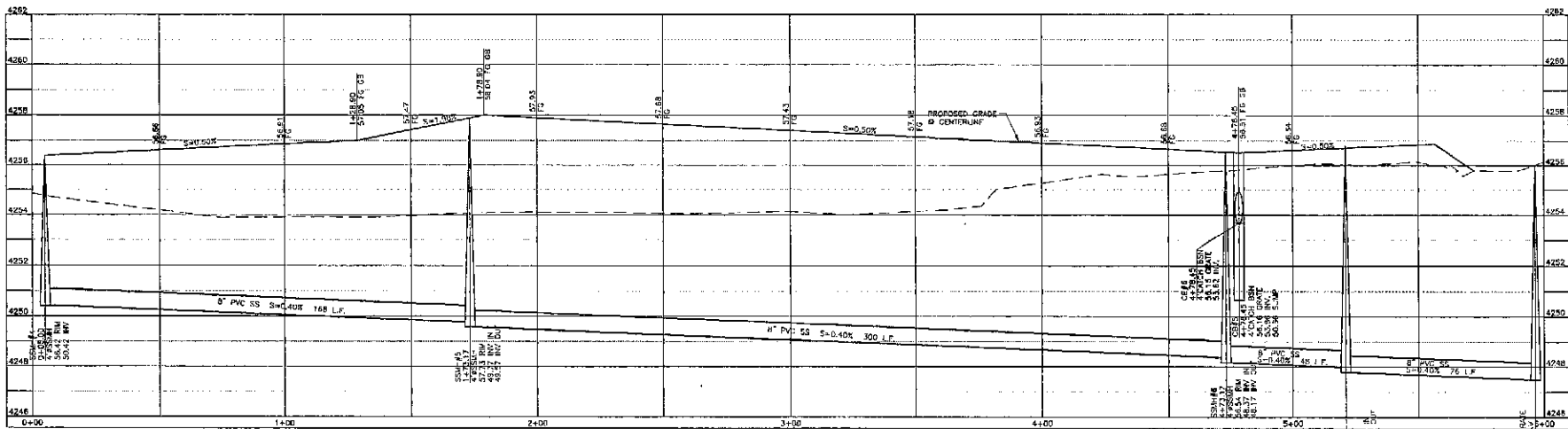
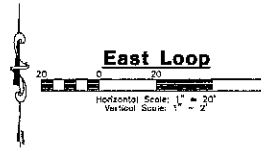
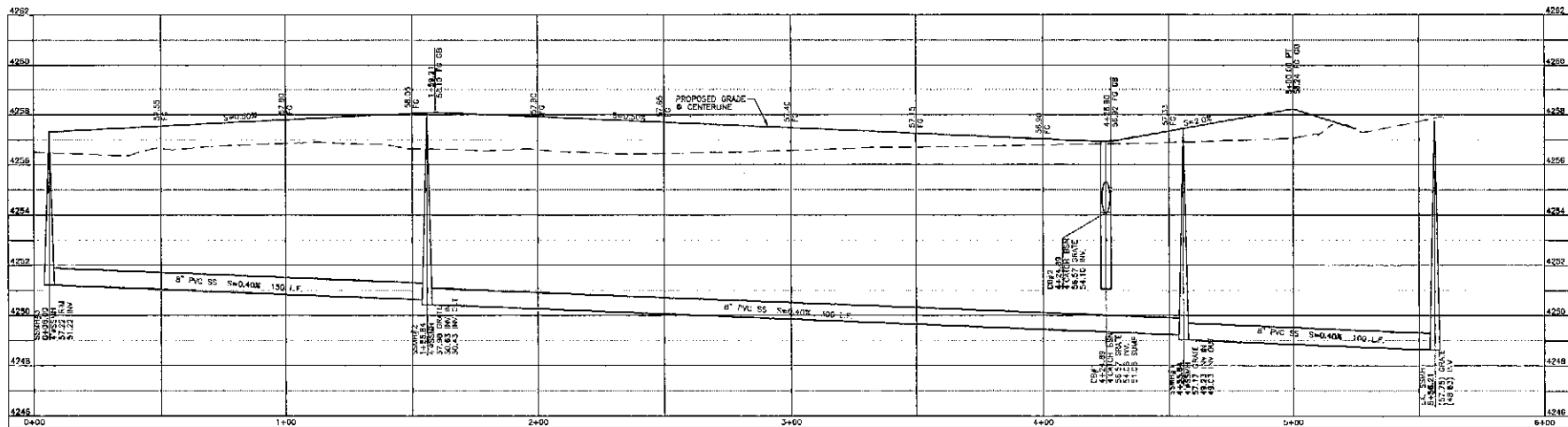
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**Porter Walton Townhomes**  
CENTRALE CITY, DAVIS COUNTY, IOWA  
**Proposed Utility Plan**

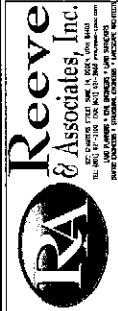
Revised: 7-15-15

**Project Info.**  
Engineer: J. J. ROY, P.E.  
Draftsman: J. ROY  
Begin Date: AUG 22, 2015  
Name: PORTER WALTON TOWNHOMES  
Number: 8440-07

Sheet **6** of **13**  
Sheets



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| REVISIONS | DATE | DESCRIPTION |
|-----------|------|-------------|
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|           |      |             |
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**Porter Walton Townhomes**  
CENTREVILLE CITY, DAVIS COUNTY, UTAH

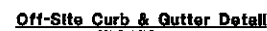
**Profiles**



**Project Info.**  
Engineer: J. NATE REEVE, P.E.  
Designer: J. NATE REEVE  
Begin Date: JUNE 22, 2015  
Name: PORTER WALTON TOWNHOMES  
Number: 6440-02

Sheet **13**  
**7** Sheets

Revised: 7-15-15



- 

|                                                                                      |                         |               |
|--------------------------------------------------------------------------------------|-------------------------|---------------|
| DESCRIPTION<br>OIL - DEFERRIS HOOD<br>SPECIFICATION AND<br>INSTALLATION<br>(TYPICAL) | DATE<br>09/08/00        | SCALE<br>NONE |
|                                                                                      | DRAWING NUMBER<br>SP-SN |               |

### Snout Installation Specifications

SCALE: NONE

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**Revised: 7-15-15**

[illegible]

## Porter Walton Townhomes

## Civil Details



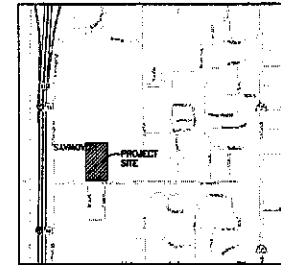
**Project Info.**  
Engineer: J. NATH NEEVE, P.E.  
Droster: C. ROCHE  
Begin Date: JUNE 22, 2015  
Name: PORTER WALTON  
TOWNHOMES  
Number: 5440-02

|       |        |
|-------|--------|
| Sheet | 13     |
| 8     | Sheets |

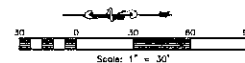
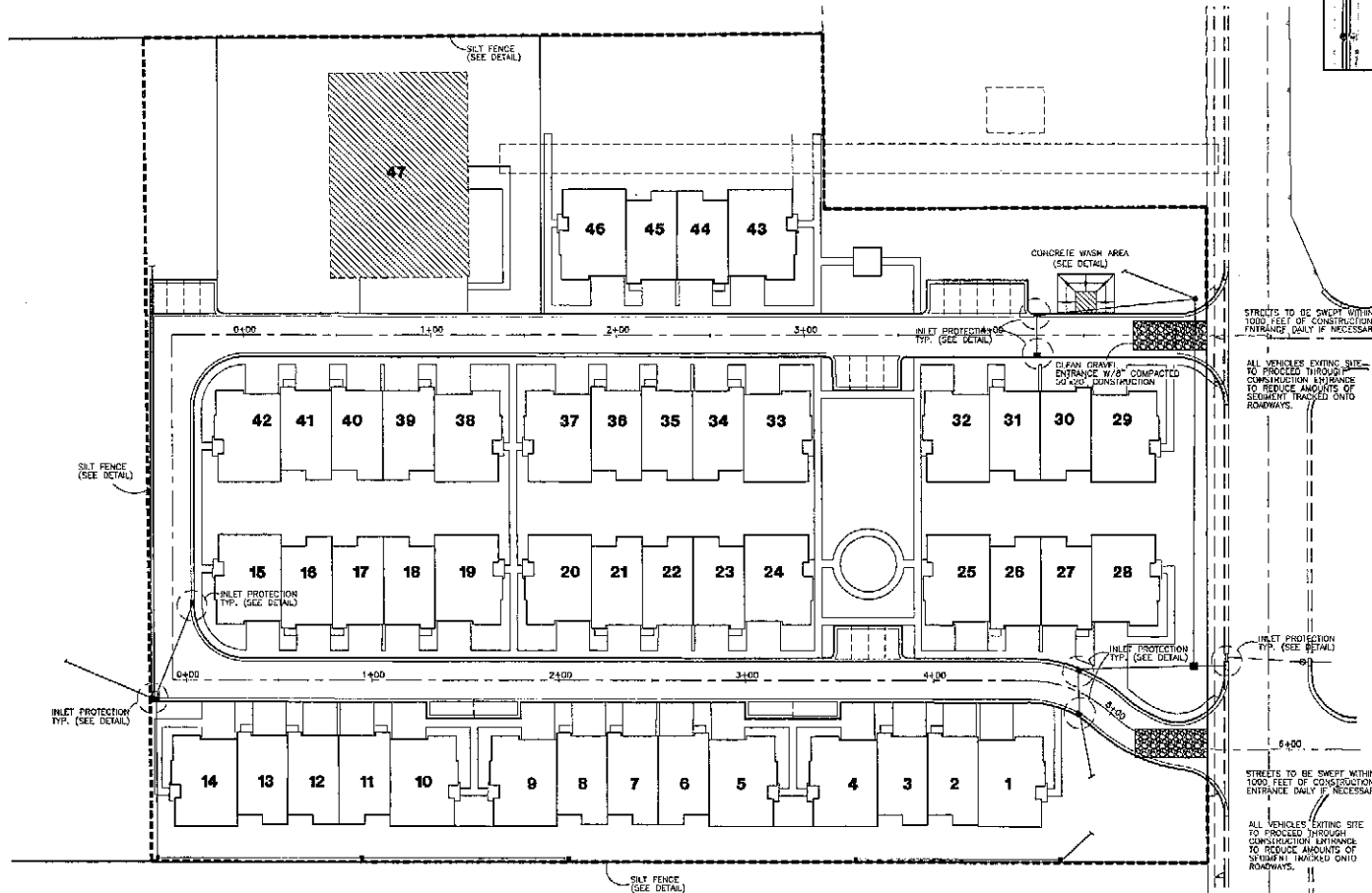
# PORTER WALTON TOWNHOMES

## Storm Water Pollution Prevention Plan Exhibit

CENTERVILLE, DAVIS COUNTY, UTAH  
JULY, 2015



Vicinity Map  
NOT TO SCALE



### Construction Activity Schedule

- PROJECT LOCATION: CENTERVILLE CITY, DAVIS COUNTY, UT
- PROJECT BEGINNING DATE: JULY 2015
- BMP'S DEPLOYMENT DATE: JULY 2015
- STORM WATER MANAGEMENT CONTACT / INSPECTOR: PATRICK SCOTT (801) 397-3755
- SPECIFIC CONSTRUCTION SCHEDULE INCLUDING BMP CONSTRUCTION SCHEDULE TO BE INCLUDED WITH SWPPP BY OWNER/DEVELOPER

**Reeve & Associates, Inc.**  
303 DAVIS STREET, SUITE 100, DAVIS COUNTY, UTAH 84003  
TEL: (801) 397-3755 FAX: (801) 397-3756  
WWW.REEVE-ASSOCIATES.COM

| DATE | DESCRIPTION |
|------|-------------|
|      |             |
|      |             |
|      |             |
|      |             |

**Porter Walton Townhomes**  
CENTERVILLE CITY, DAVIS COUNTY, UTAH  
**Storm Water Pollution Prevention Plan Exhibit**



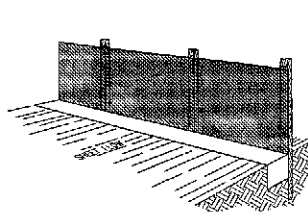
**Project Info**  
Engineer: J. PATRICK SCOTT, P.E.  
Drafter: E. ADCHIE  
Issue Date: JUNE 22, 2015  
Name: PORTER WALTON TOWNHOMES  
Number: 8440-02

Sheet **13**  
**9** Sheets

Revised: 7-15-15

## Notes:

- Describe all BMP's to protect storm water inlet.
- Describe BMP's to eliminate/reduce contamination of storm water from:
  - Drainage / building / concrete wash areas.
  - To be performed in designated areas only and surrounded with silt fence barriers.
  - Site contaminated by soil contamination.
  - If any contaminants are found or generated, contact environmental engineer and contacts listed.
  - Areas of contaminated soil.
  - If any contaminants are found or generated, contact environmental engineer and contacts listed.
  - Fueling area:
  - To be performed in designated areas only and surrounded with silt fence.
  - Vehicle maintenance areas:
  - To be performed in designated areas only and surrounded with silt fence.
  - Vehicle parking areas:
  - To be performed in designated areas only and surrounded with silt fence.
  - Fuel storage areas:
  - To be performed in designated areas only and surrounded with silt fence.
  - Material storage areas:
  - To be performed in designated areas only and surrounded with silt fence.
  - Waste containment areas:
  - To be performed in designated areas only and surrounded with silt fence.
  - Service areas:
  - To be performed in designated areas only and surrounded with silt fence.
- BMP's for wind erosion:
- Stockpiles and pile as needed to be watered regularly to eliminate / control wind erosion.
- Construction Vehicles and Equipment:
  - Maintenance:
    - Maintain all construction equipment to prevent oil or other fluid leaks.
    - Keep vehicles and equipment clean, prevent excessive build-up of oil and grease.
    - Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
    - Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
    - Spillproof and recycle wastes, such as grease, used oil or oil filters, antifreeze, cleaning solutions, combustible liquids, hydraulic and transmission fluids.
  - Fueling:
    - Fueling must occur on-site, use designated areas only from drainage.
    - Locate on-site fuel storage tanks within a bermed area designed to hold the tank volume.
    - Cover refueling area with an impervious material and install in a manner to ensure that any spills will be contained in the refueling area. To catch spills or leaks when refueling or changing fluids.
    - Use drip pans for any oil or fluid changes.
  - Washing:
    - Use as little water as possible to avoid building erosion and sediment controls for the wash area.
    - If washing must occur on-site, use designated, bermed wash areas to prevent waste water discharge into storm water, creeks, rivers, and other water bodies.
    - Use phosphate-free, biodegradable soaps.
    - Do not permit steam cleaning on-site.
- Spill Prevention and Control:
  - Minor Spills:
    - Minor spills are those which are likely to be controlled by on-site personnel. After contacting local emergency response agencies, the following actions should occur upon discovery of a minor spill:
      - Contain the spread of the spill.
      - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (i.e. absorbent materials, cat litter, etc. / or rags).
      - If the spill occurs in dirt areas, immediately contain the spill by constructing an earth dike. Dig up properly disposed of contaminated soil.
      - If the spill occurs during rain, cover the impacted area to avoid runoff.
    - Record all spills taken to report and contain spill.
  - Major Spills:
    - On-site personnel should not attempt to control major spills until the appropriate and qualified emergency response staff have arrived at the site. For spills of federal reportable quantities, also notify the National Response Center at (800) 424-9802. A written report should be sent to all notified authorities. Failure to report major spills can result in significant fines and penalties.
- Post Roadway / Utility Construction:
  - Maintain good housekeeping practices.
  - Enclose or cover building material storage areas.
  - Properly store materials such as paints and solvents.
  - Store dry and wet materials under cover, away from drainage areas.
  - Avoid mixing excess amounts of fresh concrete or cement on-site.
  - Perform washout of concrete trucks off-site or on designated areas only.
  - Do not wash out concrete trucks into storm drains, open ditches, streams or waterways.
  - Do not place material or debris into streams, ditches or water bodies that stop or reduce the flow of runoff water.
  - All public streets and storm drain facilities shall be maintained free of building materials, mud and debris caused by grading or construction operations. Roads will be swept within 1000' of construction entrance only, if necessary.
  - Install straw wattle around all inlets contained within the development and all others that receive runoff from the development.
- Erosion Control Plan Notes:
  - The contractor will designate an emergency contact that can be reached 24 hours a day 7 days a week.
  - A stand-by crew for emergency work shall be available at all times during potential rain or snow runoff events.
  - Necessary materials shall be available on site and stockpiled at convenient locations to facilitate rapid construction of emergency devices when rain or runoff is imminent.
  - Erosion control devices shown on the plans and approved for the project may not be removed without approval of the engineer of record. If devices are removed, no work may continue that has the potential of erosion until consulting the engineer of record. If deemed necessary erosion control should be reestablished before this work begins.
  - Graded areas adjacent to fill slopes must drain away from the top of the slope at the conclusion of each working day. This should be confirmed by survey or other means acceptable to the engineer of record.
  - All fill and debris shall be removed from all devices within 24 hours after each rain or runoff event.
  - Except as otherwise approved by the engineer, all removable protective devices shown shall be in place at the end of each working day and through weekends until removal of the system is approved.
  - All loose soil and debris, which may create a potential hazard to off-site property, shall be removed from the site as directed by the Engineer of record or the governing agency.
  - The placement of additional devices to reduce stream channelization within the site is left to the discretion of the Engineer of record.
  - Existing basins may not be removed or made impervious without the approval of the engineer of record and the governing agency.
  - Erosion control devices will be modified as needed to the project progress, and plans of these changes submitted for approval by the engineer of record and the governing agency.
- Conduct a minimum of one inspection of the erosion and sediment controls every two weeks. Maintain documentation on site.
  - Part II.D.4 of general permit UTR000000 identifies the minimum inspection requirements.
  - Part II.B.4.C identifies the minimum inspection report requirements.
  - Failure to complete and/or document storm water inspections is a violation of part II.D.4 of Utah General Permit UTR 000000.



Perspective View

INSTALLATION  
The silt fence should be installed prior to major soil disturbances at the drainage area. The fence should be placed across the slope along a line of uniform elevation whenever flow of sediment is anticipated. Table 1 shows generally recommended maximum slope lengths (slope spacing between fences) at various site grades for most silt fence applications.

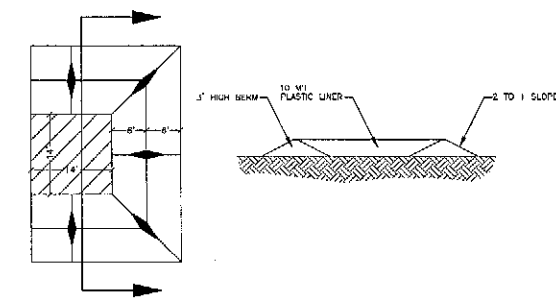
| TABLE 1:<br>Recommended Maximum Slope Lengths<br>for Silt Fence<br>(Bjorklund & Nordstrom, 1991) |                           |
|--------------------------------------------------------------------------------------------------|---------------------------|
| Slope Steepness<br>(%)                                                                           | Max. Slope Length<br>(ft) |
| <2%                                                                                              | 30.5m (100ft)             |
| 2-5%                                                                                             | 22.8m (75ft)              |
| 5-10%                                                                                            | 15.2m (50ft)              |
| 10-20%                                                                                           | 7.6m (25ft)               |
| >20%                                                                                             | 4.5m (15ft)               |

PREPARED SILT FENCE ROLLS  
Excavate a minimum 15.2m x 15.2m (50' x 50') trench at the desired location.  
Unroll the silt fence, positioning the post against the downstream wall of the trench.  
Support ends of silt fence should be joined by nesting the end and post of one fence into the other. Before nesting the end posts, rotate each post until the geotextile is wrapped completely around the post, then pull the end posts to create a tight seal as shown in Figure 1.  
Drive posts into the ground until the required fence height and/or anchorage depth is obtained.  
Bury the loose geotextile at the bottom of the trench in the upstream trench and backfill with natural soil, tamping the backfill to provide good compaction and anchorage.  
Figure 2 illustrates a typical roll of fence installation and anchor trench placement.

FIELD ASSEMBLY  
Excavate a minimum 15.2m x 15.2m (50' x 50') trench at the desired location.  
Drive wooden posts, or steel posts with bearing projections, against the downstream roll of the trench. Maximum post spacing should be 2.4-3.0m (8-10ft). Post spacing

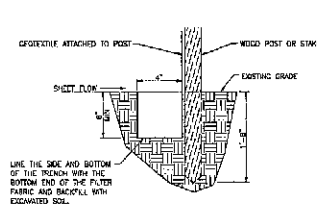
Silt Fence Detail

SCALE: NONE

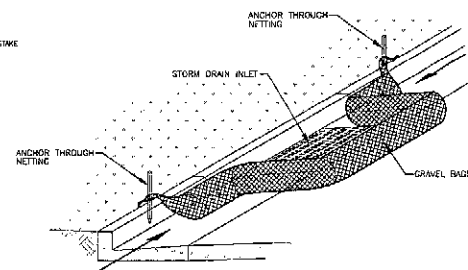


Concrete Washout Area  
w/ 10 mil Plastic Liner

SCALE: NONE



Section

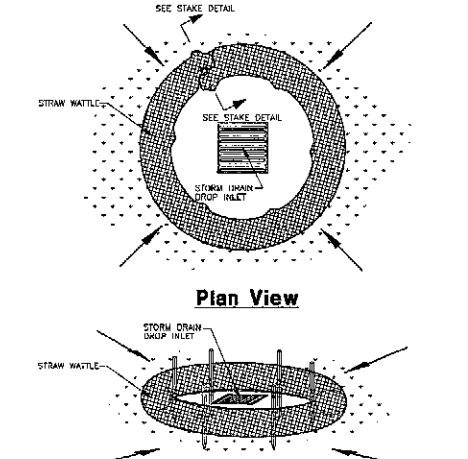


Inlet Box Protection

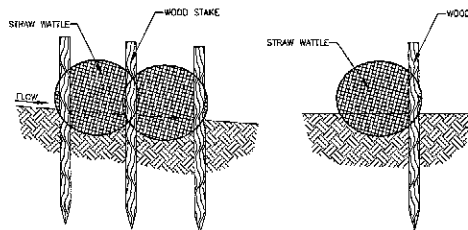
should generally be less than three (3) times the height of the fence.  
If a steel or plastic mesh is required to reinforce the geotextile, it shall have a minimum mesh opening of 15.2cm (6").  
Maintain the mesh to the upslope side of the inlet using heavy duty wire staples, tie wires or hog strings. Extend the mesh into the bottom of the trench.  
The geotextile shall then be stapled or sewed in the posts. An extra 20-30cm (8-12") of geotextile shall extend into the trench.

INSPECTION  
Inspect the silt fence daily during periods of rainfall, immediately after significant rainfall event and weekly during periods of no rainfall. Make any repairs immediately.  
When sediment deposits behind the silt fence are one-third of the fence height, remove and properly dispose of the sediment.  
Avoid damage to the fabric during deposal.

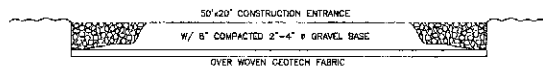
REMOVAL  
Silt fence should not be removed until construction cannot and the system zero has been properly stabilized and/or revegetated.  
Figure 1: Top View of Roll-to-Roll Connection  
Figure 2: Illustration of typical roll of fence installation and anchor trench placement.



Drop Inlet Protection

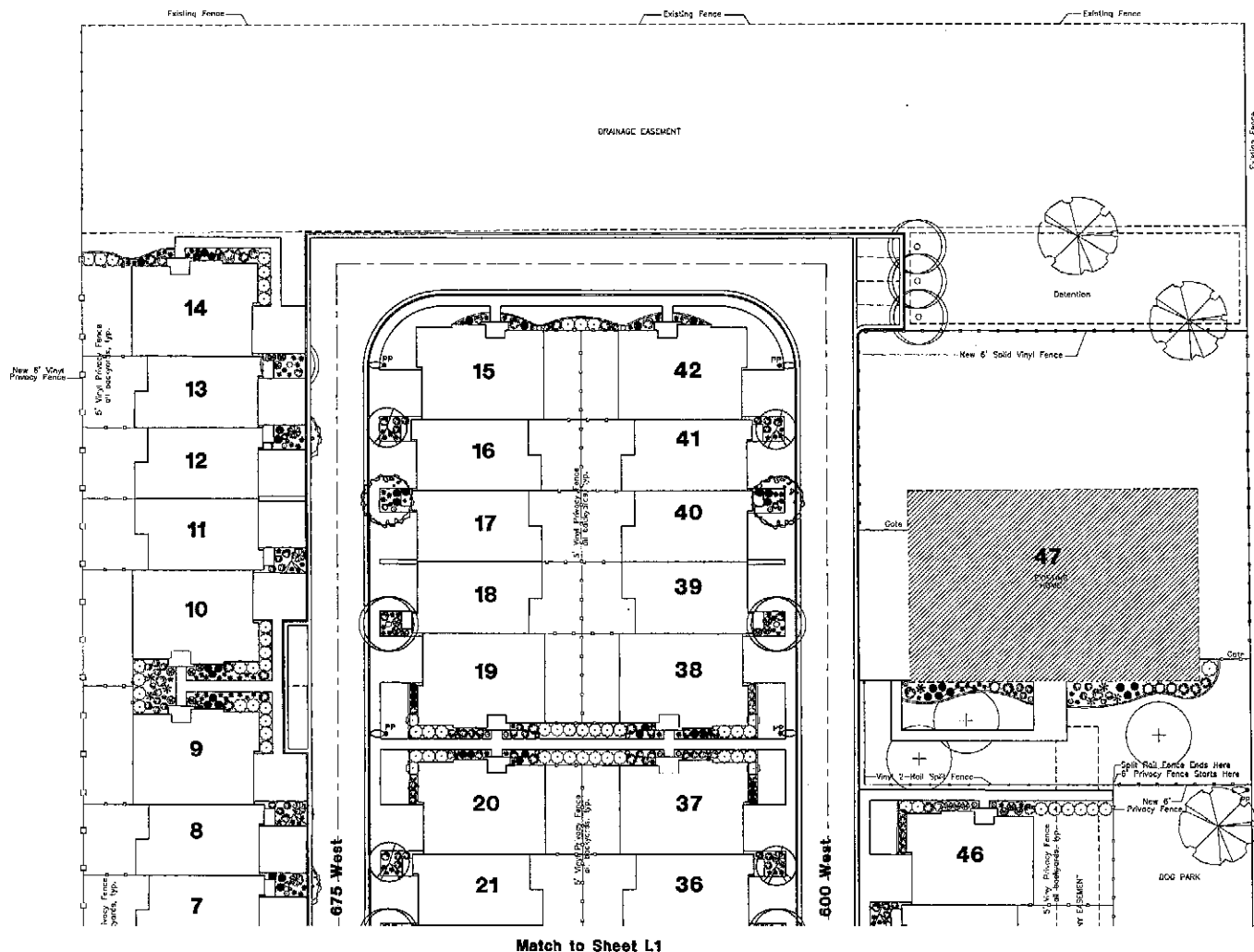


Stake Detail

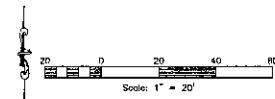


Cross Section 50' x 20' Construction Entrance





Match to Sheet L1



**Developer Contact:**

Brighton Homes Utah, L.L.C.  
215 North Redwood Road, Suite 8  
North Salt Lake City, Utah, 84054  
Ph: (801) 397-9755

Revised: 7-15-15



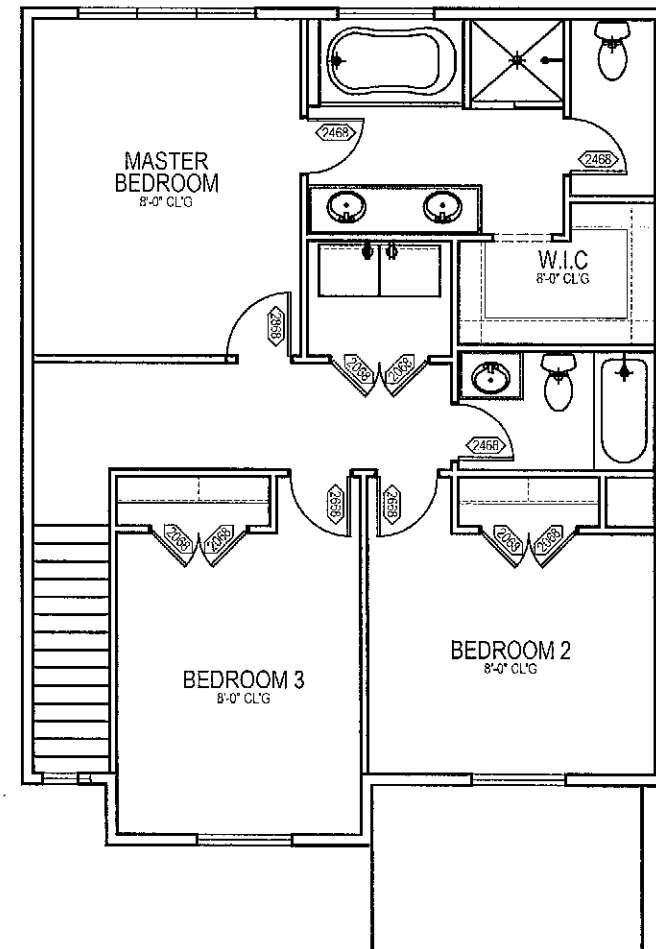
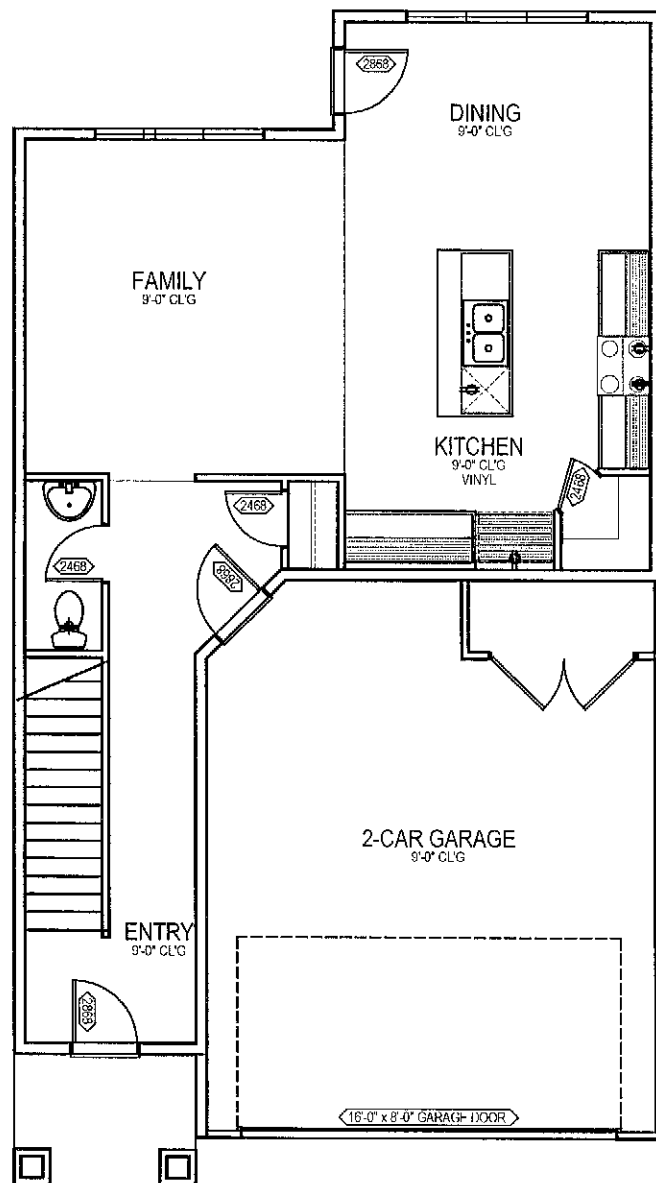
**Project Info.**  
Engineer: D. REYNOLDS  
Drafter: J. HALL, KELLY, P.E.  
Begin Date: JUNE 22, 2015  
Name: PORTER WALTON TOWNHOMES  
Number: 6449-02

Sheet **L2** of **12** Sheets

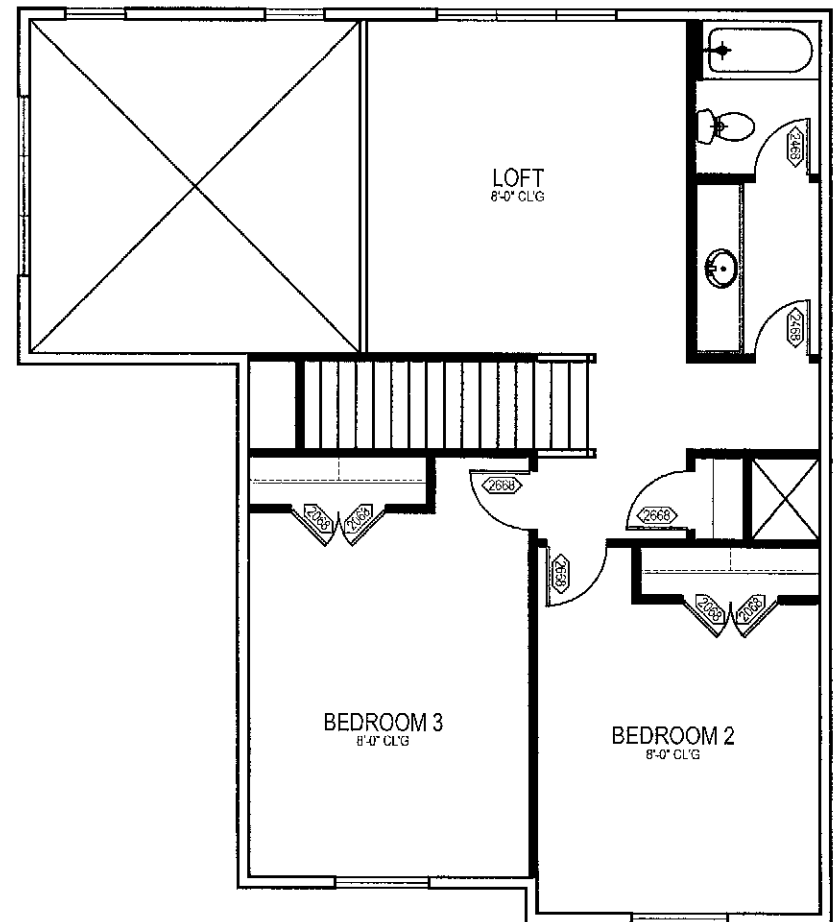
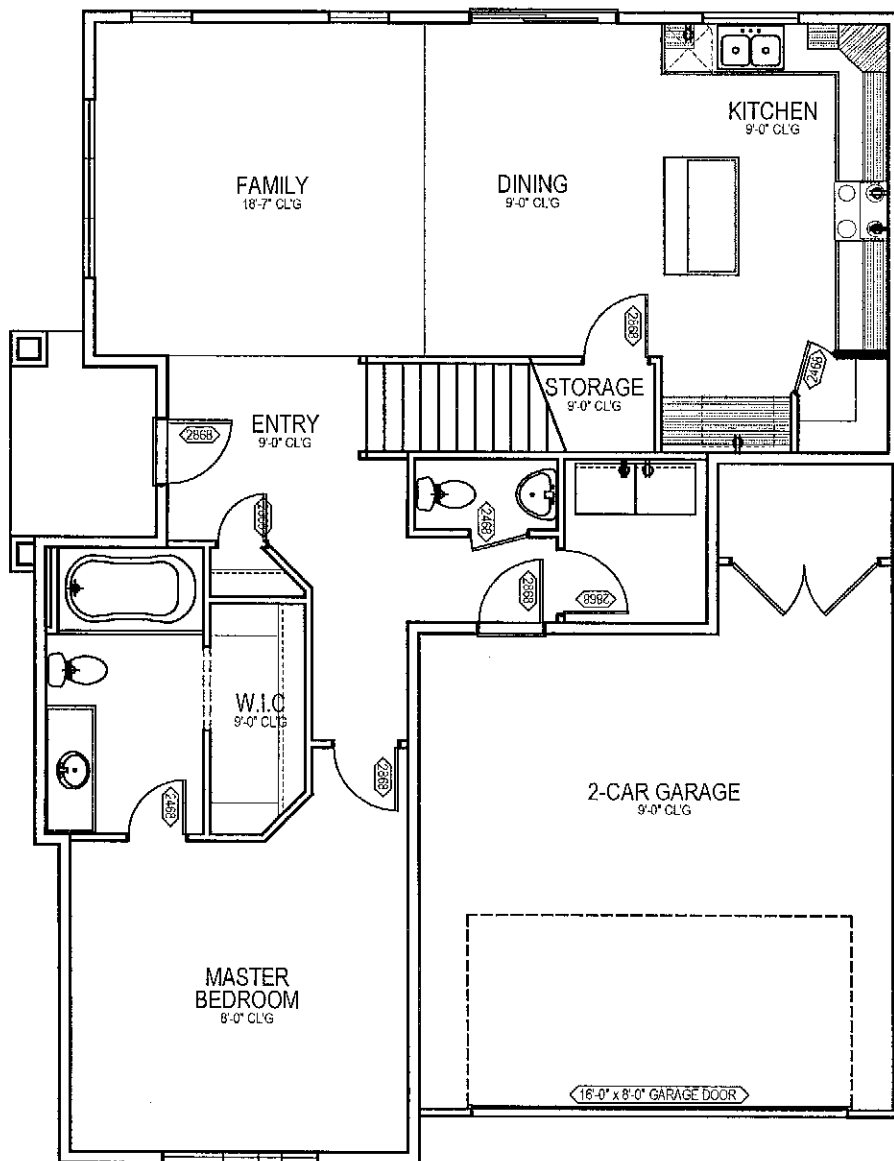
**Porter Walton Townhomes**  
CENTRALE CITY, DAVIS COUNTY, UTAH  
**Landscape Plan**

**Reeve & Associates, Inc.**  
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