PRELIMINARY GRADING AND DRAINAGE ENGINEERING DESIGN REPORT

PREPARED IN ACCORDANCE WITH MDEQ'S CIRCULAR DEQ-8 AND
CITY OF MISSOULA SUBDIVISION REGULATIONS

for

West End Homes Subdivision

Located at:

TRACT E-1 OF CERTIFICATE OF SURVEY NO. 6889 AND TRACT D OF CERTIFICATE OF SURVEY NO. 6850, RECORDS OF MISSOULA COUNTY, LOCATED IN THE NW1/4 AND SW1/4 OF SECTION 7, TOWNSHIP 13 NORTH, RANGE 19 WEST AND THE NE1/4 AND SE1/4 OF SECTION 12, TOWNSHIP 13 NORTH, RANGE 20 WEST, PRINCIPAL MERIDIAN MONTANA, MISSOULA COUNTY, MONTANA. CONTAINING A TOTAL OF 71.39 ACRES, MORE OR LESS.

July 2022

Prepared For:
Evergreen Housing Solutions, LLC
131 S. Higgins Ave, Suite P-1
Missoula, MT 59802

Prepared By:
IMEG Corp.
1817 South Ave W, Suite A
Missoula, MT 59806

1.0 GENERAL

Wishcamper Development Partners is proposing to develop the above-described property with 260 single-family home lots as well as some open space and a city park. In addition to the proposed homes the project will include sidewalks, roads and dedicated open space/parks. The property consists currently of 64.76 acres made up primarily of farmland for hay which is still actively farmed. This acreage excludes the 6.21 acres which makes up the England Boulevard Right-of-Way as well as the 50' wide swath of Flynn Square running south past the southern property boundary. The England Boulevard Right-of-Way is located adjacent to the property and is being currently being designed by DJ & A. As this property is located within the Sx^{w}tpqyen Master Plan Area, this report will follow the rules laid out in the Form Based Code (FBC) which call for light imprint stormwater infrastructure. Refer to Section 4.3 of this report for a breakdown of light imprint infrastructure proposed for the development.

As laid out in the FBC, the goal for this area is to mitigate and treat stormwater runoff as close to the source as possible. Following meetings with the City of Missoula Public Works Department, it has been decided that the entirety of the stormwater from the 10-year storm and smaller will be infiltrated using drywell sumps within the roadway curb lines and in the alleys. 100-year storm mitigation will be provided on-site by a combination of drywell sumps and shallow detention ponds. We expect that final designs for each phase of the development will utilize these bio-swales to propose less drywell sumps based on lower safety factors and some storage volume. The drywell sump locations shown on the plan are preliminary and subject to change with final designs.

The Storm Water Site Evaluation Form provided by the City of Missoula (attached in Appendix C) determined that this site is of medium priority, with 22 points. This is primarily due to the proposed development being a subdivision and over 0.5 acres in size as well as discharging to Grant Creek. This report will address the Post-Development Runoff Control Requirements,

meet Water Quality Control Requirements, and include a Stormwater Management Site Plan (See Civil Construction Plan Set). In the future, a Post Construction Stormwater Management Site Plan Review Checklist and an Erosion Control Site Plan Checklist will be included in Appendix C. Refer to Section 5.0 for information regarding SWPPP on site.

2.0 DRAINAGE DESIGN CRITERIA AND METHODS USED

Per correspondence with Missoula City Public Works and Mobility, Hydraflow Hydrographs was used to calculate stormwater volumes for this development. Within this program, the TR-55 model was used, based on the principles of the SCS runoff equation, to estimate runoff requirements. The flows from the 2-, 10-, and 100-year, 24-hour storm event were analyzed. For the purposes of this report, the 10- and 100-year storm calculations have been updated for revised finished grading and new proposed lot layouts.

3.0 EXTENT OF STORM DRAINAGE

The following information pertains to on and off-site flows that may affect the proposed development as well as conveyance for stormwater flow rates that will be increased due to the development. Detailed information on the existing and proposed drainage patterns is provided in the Drainage Basin Exhibit in Appendix A.

3.1 DELINIATION OF DRAINAGE AREAS WITHIN SUBDIVISION

3.1A EXISTING BASIN

The project site for drainage calculations is comprised of approximately 64.76 acres of farmland which is currently harvested for hay (excluding the England Boulevard R-O-W and section of Flynn Square Park). This property will be considered to contain fourteen (14) drainage basins (Basins A-N) for the purposes of stormwater runoff calculations. These basins were developed as a result of the sites proposed grading plan. The general slope of the existing site is 0.5%, sloping from east to west. As stormwater runoff historically would sheet flow across the site, there are no major drainage channels on the property that concentrate stormwater. There is also no single outlet or discharge point, as the stormwater runoff sheet flows across the entire site to where it crosses the western property boundary. The site is bounded to the east by Flynn Lane, to the south by the proposed England Boulevard, and to the north and west by undeveloped property. As this area is within the Master Plan, we expect this undeveloped property to be developed in the future. The property also includes some development south of England Boulevard, although a majority of this will be a dedicated city park in addition to some single-family lots. The total area of each existing basin can be seen in the below table.

The entire property is in the Zone X floodplain designation. Ground cover of the unimproved site is grass with fair coverage. A study conducted by New Fields proved that the groundwater depth to existing grade around the property was from 14 to >20 feet. We utilized Figure 4-2 of the study “2-Year Creek Event, 2-Year Storm Discharge – Existing Sumps, Excluding Flynn-Lowney Ditch” as per the City of Missoula’s recommendation. The west end of the property (Basins K, J, L, & M) have the shallowest groundwater throughout the site although it is still deep enough to allow standard depth drywell sumps without any distance to groundwater issues. There are no existing waterways or wetlands located on the subject property.

Existing Basin	Total Area (acres)
Basin A	1.71
Basin B	3.52
Basin C	5.2
Basin D	2.83

Basin E	4.16
Basin F	4.64
Basin G	4.43
Basin H	3.33
Basin I	1.87
Basin J	1.92
Basin K	1.99
Basin L	2.05
Basin M	1.09
Basin N	26.18

Table 1: Basin Areas

3.1B DEVELOPED BASINS

The developed on-site basins will not change from the fourteen (14) drainage basins mentioned above in Section 3.1A. The basins were developed based on the proposed site grading. Within these basins we have proposed some shallow stormwater detention ponds, drywell sumps, and bio-retention areas to mitigate the 10-year and 100-year storms. Refer to Section 4.3 for stormwater runoff mitigation design details.

3.2 DELINEATION OF DRAINAGE AREAS OUTSIDE OF SUBDIVISION

Flynn Lane which is located to the east is elevated from the surrounding properties (both east and west), and our preliminary road plans have been designed to limit any runoff from Flynn Lane to be conveyed onto the property. Additionally, Flynn Lane will have proposed curb and gutter with this development plan on the west side of the road. No other stormwater from neighboring areas should discharged onto the property.

Regarding downstream drainage basins, the outfall for this project will be the property to the south and west of Flynn Square Park as well as the property to the west of Basins K and L. These are all locations which water has been historically discharged from the property. Stormwater will be conveyed across Flynn Square Park as unconcentrated sheet flow and therefore will discharge from the property as unconcentrated flow as it had historically. Methods of stormwater dissipation such as level spreaders may be utilized along the western boundaries of Basins K and L to ensure that all stormwater discharged from the site is unconcentrated sheet flow. Any stormwater runoff discharged from the property will be at a minimum equal to the pre-development 100-year storm. Stormwater may also be discharged on the western boundary of Basins K & L. We anticipate any stormwater discharged from the property's western boundary to eventually make its way to the existing drainage ditch on the neighboring property as it had historically.

~~3.3 MODELED OFF-SITE FLOWS~~

3.4 PROVISIONS TO PASS OFF-SITE STORMWATER FLOWS

IMEG does not anticipate any stormwater runoff from off-site to cross the subject property. This is mainly due to the topography of the surrounding area sloping from east to west, and the location of Flynn Lane to the east of the property. See the description of Flynn Lane in Section 3.2. The property to the north of the subject property slopes away to the north, so there are no expected flows from this property. Therefore, no specific design is required for this project for off-site flow conveyance. However, we do believe that there will be capacity within the curb lines of the road to handle additional stormwater, although there will not be any infiltrative capacity in the proposed drywells to infiltrate off-site flows. Any off-site flows which may pass through the site will be routed through the curb lines of the development and be discharged along with the water generated on-site.

North of the property, Flynn Lane does not have a defined drainage swale which flows south towards the subject property. There does exist an irrigation ditch running east to west, north of the property which is conveyed under Flynn Lane. However, this swale continues to go east to west through the neighboring property to the north. Storm drainage from Flynn Lane north of the project site sheet flows onto the neighboring property and flows as sheet flow from east to west. We do not anticipate any storm water from either the road or the neighboring property to be discharged onto the subject property. Additionally, Flynn Lane will be rebuilt north of the property in the near future to have curb and gutter. In this case, stormwater will be mitigated within the road by drywell sumps.

4.0 PROVISIONS TO MITIGATE ON-SITE STORMWATER FLOWS

With the increase in impervious coverage in every basin, there will be increased runoff. The general stormwater mitigation plan for the West End Homes Subdivision is as follows: The entirety of the post-development 10-year storm will be infiltrated through drywell sumps with minimal ponding in the curb line. The property has been broken up into three larger areas for 100-year mitigation known as the Western, Northern and Western Areas. These areas encompass the fourteen (14) proposed drainage basins on-site and each have a separate plan for 100-year storm mitigation (difference between the pre- and post-development 100-year storm). The Western area will utilize drywell sumps with some ponding within the alleyways, the Northern Area will utilize a shallow regional detention pond located in Open Space #3, and the Southern Area will utilize bio-retention areas and drywell sumps with ponding in the curb lines and alleyways. No ponding depths shall exceed 1' deep along the curb line. Refer to Section 4.3 for a detailed description of the stormwater runoff mitigation plan for each 100-year area.
See Section 4.1F for more information on pre- and post-development site variables. Below in Sections 4.1-4.3, the general plan for stormwater mitigation is laid out on the lot, corridor and neighborhood level. This plan was previously discussed as the preferred stormwater mitigation plan with the Missoula Public Works Department on 10/18/2021, in which we decided drywell sumps would be the preferred method of stormwater mitigation for the 10-year storm. We have however, since revised the plan to remove the regional detention swale in Flynn Square Park and replace it with bio-retention areas, a shallow detention pond on-site and additional drywell sumps. We will be working closely with the City of Missoula going forward to ensure that this plan will meet all the requirements of the Sx^{w}tpqyen Master Plan as well as those of the Public Works Department.

As half street improvements are being proposed for Flynn Lane, we will be proposing stormwater mitigation facilities to mitigate the difference between the pre- and post-development 100-year storm. Keeping in line with our recommendations for the project site based on our infiltration testing completed, we will be proposing one sump per 10,000 SF of impervious coverage at a minimum. A sump will be installed at every low point in the road to ensure that stormwater does not inundate the road during the 10-year storm.

4.1 STORMWATER QUALITY CONTROL AND LIGHT IMPRINT COMPLIANCE

Stormwater quality has been addressed by mitigating stormwater during smaller storm events as close to the source as possible. Smaller storm events and the beginning of larger storm events often have runoff with the most pollutants. By infiltrating storms up to the post-development 10-year, we ensure that the first 0.5" of rainfall on impervious surfaces will be treated, which will cut down on pollutants. Refer to the Storm Drainage Summary Table in Appendix B for a breakdown of total stormwater volume detained per basin. Additionally, the initial rainfall will take up the heat of the developed impervious areas and by dissipated by the ground prior to reaching the Creek.

The Sx^{w}tpqyen Master Plan has laid out that at least one piece of light imprint stormwater mitigation infrastructure be implemented in the lot, corridor, and neighborhood level of the

subdivision. Refer to the sections below for a narrative on how the light imprint infrastructure is being implemented throughout this development.

4.1A LOT LEVEL STORMWATER MITIGATION

The proposed subdivision includes three different transects as laid out in the Sx^{w}tpqyen Master Plan. The acreage is split with half being T3 and the other half being split between T4-O/R. T3 lots are planned to be single family home lots, with each home being stand-alone. There will subsequently be generally more pervious yard area on these lots than on the T4. Refer to the Master Site Plan provided in the Subdivision Application to reference the lot sizes in relation to what is being proposed on each lot. Discussions with the City of Missoula Public Works Department have led to the minimization of any stormwater mitigation on the lot level. This is primarily due to maintenance concerns with any stormwater infrastructure located on privately owned lots. However, each lot will discharge stormwater from the buildings directly into the grassed yard which will act as a vegetative buffer before the stormwater runoff is concentrated in the alley.

4.1B CORRIDOR LEVEL STORMWATER MITIGATION

Any initial stormwater runoff which is discharged into or generated by the proposed alley, roads and developed lots will be infiltrated into proposed drywell sumps. Following discussions with the City of Missoula Public Works Department, we have decided to concentrate all stormwater runoff within the road corridors to the curb line. This will reduce maintenance for the City in the long run and ensure stormwater runoff is captured by the proposed drywell sumps. Where feasible, we have included bio-retention areas at road intersections. We have modeled these areas after the City Standard Detail-620 and they are designed to help slow down the flow of water to reduce sediment, temperature and nutrients of the stormwater runoff. Each bio-retention area will have a drywell sump installed at the low point to promote positive drainage to comply with the Airport's request of no standing water following 48 hours after a storm event. Bio-swales will be fully designed in future drainage report iterations.

4.1C NEIGHBORHOOD LEVEL STORMWATER MITIGATION

For storms greater than the 10-year, stormwater will be conveyed through the neighborhood before discharging off the property. For a majority of the project site, stormwater will flow over grassed area before being discharged from the site. This grassed buffer will treat stormwater for temperature, sediments and pollutants before being discharged from the site.

4.2 CALCULATONS & DESIGN

Calculations for this report are based on the SCS Type II Rainfall Distribution and the TR-55 module within the Hydraflow Hydrographs modeling program. Calculations were made using curve numbers, basins, and time of concentration to ensure proper routing and that any proposed infrastructure is not inundated. For any variables, values, equations, or calculations not explicitly shown below in this report, refer to the attached Hydrographs Summary Report in Appendix B.

To comply with the Post Development Runoff Control Requirements, stormwater from the project shall be discharged at pre-development flow rates for the 100-year storm.

4.2A HYDROLOGIC SOIL GROUP

The NRCS Soils Data was obtained from the Web Soil Survey website (located at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) found in Appendix C. The NRCS Soils Data for this site shows it to be Desmet Loam, which is Soil Group B.

4.2B CURVE NUMBERS & LAND USE DATA

As explained above, the existing on-site soil is Hydrologic Soil Group B, and is primarily grass and weeds in fair condition in addition to a gravel driveway. The corresponding weighted Curve Number (CN) of 69 (Grass) was used for every pre-development basin in the TR-55 module. In the post-development condition, all proposed impervious infrastructure (i.e. buildings, asphalt, concrete, etc.) was accounted for in each basin. All pervious ground in the post-development condition has been determined to be primarily grass in good condition; therefore, the corresponding weighted Curve Numbers (CN) of 61 (Grass) and 98 (Impervious) were utilized for the post-development condition in the TR-55 module. See Appendix B for the data used for this site.

4.2C BASINS AND AREAS

The site was analyzed as fourteen (14) basins that do not change between the pre- and post-development conditions to simplify mitigation calculations, as described in Section 3.1B above. Basins were delineated based on the post-development grading plan.

4.2D TIME OF CONCENTRATION

Time of concentration was determined by the TR-55 module in Hydraflow Hydrographs and is calculated based on the longest flow path and watercourse slope of the pre-development and post-development conditions for the site and individual basins. It is important to note that, as per Chapter 6 of the Missoula City Public Works Standards and Specifications Manual, if the TR-55-calculated time of concentration was less than 5 minutes, the minimum time of concentration of 5 minutes was used in the calculations for that basin.

4.2E STORM DATA

The SCS Method uses 24-hour storm depths provided by Chapter 6 of the Missoula City Public Works Standards and Specifications Manual for each design recurrence interval. In this case, the 2-year, 10-year, and 100-year storm event were analyzed.

4.2F SUMMARY OF SITE VARIABLES

See the Hydrograph Reports included in Appendix B for both the Pre- and Post-Development site conditions. The following are the Curve Numbers used to calculate the composite curve numbers for each drainage basin.

Ground Cover	Curve Number
Paved Parking Lots and Roofs	98
Paved Roads with Curb	98
Good Condition Open Space	69
Fair Condition Open Space	61

Table 2: Curve Number Type

Composite Curve Numbers for lots are calculated based on max allowable impervious coverage per the Master Plan. The table below shows the percentage of impervious coverage designed for per lot type.

Lot Type	Impervious Coverage Percentage
T3	60%
T4	70%

Table 3: Curve Number Type

Storage is being calculated to infiltrate the entirety of the 10-year storm before any stormwater is discharged from the site. Therefore, the first 0.5" of rainfall will be infiltrated using drywell sumps.

4.3 RUNOFF MITIGATION

As mentioned above, 100% of the post-development 10-year storm will be infiltrated on-site and the remaining stormwater (difference between the pre- and post-development 100-year storm) will be detained in different ways depending on the area. See below for a table breaking down which 100-year areas are comprised of which basins. These areas are also delineated in the drainage basin exhibit located in Appendix A. Basin N has been excluded here as it represents Flynn Square Park.

Northern Area	Southern Area	Western Area
Basin A	Basin I	Basin E
Basin B	Basin J	Basin F
Basin C	Basin K	
Basin D	Basin L	
Basin G	Basin M	
Basin H		

Table 4: 100-Year Area Breakdown

4.3A RUNOFF RATES & VOLUME

The table included in Appendix B is a summary of the drainage calculations for the post-development 10-year storm and the pre- and post-development 100-year storm. The table is broken down into the three 100-year storm mitigation area delineations as well as Flynn Square Park and lays out how much stormwater needs to be detained for the 100-year storm as well as the peak flowrate discharged for each basin and "area".

In addition to the above drainage calculations, we have performed calculations to determine how many sumps will be required to infiltrate the entirety of the 10-year post-development storm. Hydrographs have been developed to determine the peak runoff rate for areas with 10,000 and 20,000 square feet of impervious coverage. As we have 14 different infiltration rates which are shown below in Section 4.3B, we have split up the regions into areas that can be infiltrated with either one sump per 10,000 sf or 20,000 sf. See the map included in Appendix A for areas which this condition is true. In general, this configuration should infiltrate the entire 10-year peak flow for each basin within the project site. Final designs for each phase of the development will incorporate safety factors for pre-treatment of sumps as well as full calculations

The peak flow for the 100-year storm will be much reduced by the proposed drywell sumps and bioswales used to mitigate the 10-year storm. Additionally, all stormwater for

the 100-year storm will be mitigated on-site before overflowing into Flynn Square Park for the Northern and Southern Areas and the Neighboring property to the west for the Western area. Attached in Appendix B is a Stormwater Runoff Table which summarizes the peak discharge rate of each area during the 100-year storm. We have calculated each discharge to be less than the pre-development 100-year storm. Additionally, the time of concentration flow path exhibit in Appendix A includes information on how stormwater will be discharged from each basin and conveyed throughout each of the three areas. Each basin discharges at less than pre-development 100-year peak flowrates.

4.3B INFILTRATION

Tetra Tech was contracted to perform 6 infiltration tests throughout the subject property. In addition, data has been used from multiple infiltration tests performed for the BUILD Grant along England Boulevard. In total we have fourteen (14) different infiltration rates for the project site. Each drywell sump is within the 300' radius to each bore hole with a few exceptions. In some instances, a proposed drywell sump was located outside the 300' radius; in these instances, the closest conservative infiltration rate was used. Additionally, the most conservative infiltration rate was used when a sump was in multiple infiltration rate zones. The findings from these infiltration tests can be found within the Percolation Test Results located in Appendix D. For preliminary designs, we have taken the conservative approach of assuming a safety factor of 3 for each sump. The final storm drainage reports for each phase will utilize a safety factor of 2 for sumps with pre-treatment. As some sumps will likely have faster infiltration rates, we anticipate there will be less proposed drywell sumps with future final stormwater reports for the different subdivision phases. A total surface area of 61.23 sf (Per Chapter 6 of the City of Missoula Public Works Manual) was used with the infiltration rate to calculate the flow rates shown in the table below:

Bore Hole	Infiltration Flow Rate (CFS)
1	1.45
2	0.19
3	0.24
4	0.3
5	0.29
7	0.64
501	0.39
502	0.98
503	13.6
504	0.16
505	0.16
506	0.19

Table 5: Infiltration Flow Rate Summary

The full range of infiltration rates were tested with the peak flow rate of each hydrograph (10,000 SF, 20,000 SF Impervious Coverage 10-Year Storm) to test whether overflow greater than 50 cf occurred. We calculated that drywell sumps with infiltration rates of 0.64 cfs or higher could infiltrate up to 20,000 sf of impervious coverage. All other drywell sumps will have a maximum of 10,000 sf of impervious coverage draining to them. We have included in Appendix B the sump overflow calculations for 10,000 sf of impervious coverage draining to a sump with infiltration rate 0.16 cfs as well as the calculations of 20,000 sf draining to a sump

with an infiltration rate of 0.64 cfs. Refer to the Infiltration Rate Exhibit included in Appendix A for a delineation of the two zones (20,000 SF vs 10,000 SF).

4.3C 100-YEAR RUNOFF MITIGATION AND STORAGE

For the Northern area, all overflow stormwater from the proposed drywell sumps will be routed to Open Space Area 3 where we have proposed a shallow detention pond. This pond will be proposed to be approximately 6-inches deep with 5% side slopes and encompass all the area to the west of the sewer main which crosses the space. Calculations for pond sizing have been included in Appendix B of this report. The pond will provide 10,375 cf of stormwater detention volume. The pond will have a drywell sump installed to aid in the infiltration of stormwater runoff when the ground is frozen and to ensure stormwater runoff is infiltrated in under 48-hours as required by the Missoula Airport.

For the Southern Area, there are a total of eight (8) bio-retention areas which will be designed with dimensions as per City Standard 620. We have calculated a standard storage volume for each bio-retention area of 210 CF. in total, the bio-retention areas in this area will provide 1,680 CF of stormwater runoff storage. The remaining 1,075 CF of stormwater runoff required to be stored for the 100-year storm will be infiltrated by drywell sumps as well as pond within the curb line. No ponding within the road will be deeper than 1’.

For the Western Area, we are proposing additional sumps within the alleyways to infiltrate the difference between the pre- and post-development 100-year storm runoff. There may be some ponding within the alleys during the 100-year storm. Just like in the roads, no ponding will be deeper than 1’.

4.3D INUNDATION

Naturally, the site will become inundated once the proposed detention facilities to mitigate the difference between the pre- and post-development 100- storm have been exceeded. We expect there to be minimal ponding within the road during the 100-year storm due to the number of sumps proposed and the pipe crossings under England Boulevard for the Northern and Southern areas. Stormwater runoff for Basins I-M will flow to the west as it had historically, while Basins A-H will be conveyed under England Boulevard and will bubble up once the outlet drywell sump has been inundated. The drywell sumps being utilized for the England Boulevard pipe crossings will act as pre-treatment to ensure that all sediment is kept out of the crossing pipes. Additionally, as we are planning on setting the elevation of the downgradient sump of the road crossing, we do not anticipate any ponding due to the pipe crossing. We have included calculations in Appendix B for each pipe crossing to show that stormwater should be conveyed under England Boulevard with minimal to no ponding during the 100-year storm. With peak discharge rates of 1.67 and 0.44 CFS for the Northern and Southern areas, respectfully, the standard drywell sump rim should be able to handle these flows without any issues.

4.4 DOWN-GRADIENT ANALYSIS

Stormwater will discharge along the western boundary of Flynn Square Park for the Northern and Southern Areas, and the western boundary of Basins L and K for the Western Area. No stormwater is planned to be discharged to the Flynn-Lowney Ditch. The property down gradient is currently undeveloped, however it will be developed as a part of the Master Plan in the future. Stormwater will be conveyed across Flynn Square Park as unconcentrated sheet flow and therefore will

discharge from the property as unconcentrated flow as it had historically. Additionally, the peak flow of the park (stormwater being discharged from the development and the peak flow of the park itself) is less than the pre-development 100-year storm of the park itself. Methods of stormwater dissipation such as level spreaders may be utilized along the western boundaries of Basins K and L to ensure that all stormwater discharged from the site is unconcentrated sheet flow. Any stormwater runoff discharged from the property will be at a minimum equal to the pre-development 100-year storm. We anticipate any stormwater discharged from the property's western boundary to be contained within the drainage ditch to the west of the property as it had historically. Based on ariel imagery and topographical knowledge of the area it seems that stormwater runoff will continue to travel as unconcentrated sheet flow until it is discharged into this drainage ditch.

6.0 EROSION CONTROL & STORMWATER POLLUTION PREVENTION PLAN

A Stormwater Pollution Prevention Plan (SWPPP) will be required through the Montana Department of Environmental Quality (MDEQ), it will be the responsibility of the Contractor (or owner if previously agreed upon) to prepare, obtain, and administrate a SWPPP and any other erosion control permits required by City of Missoula. Erosion and sediment control in the form of BMP's or stabilized surface throughout the project area will minimize the potential for pollutants to leave the site.
Throughout the project site during construction, all stormwater inlets will be protected as per City Standard 651 to ensure that no sediment is discharged into the drywell sumps. Additionally, Perimeter Control will be installed as per City Standard 652 along the downstream property boundary. In this case, the western property boundary will have perimeter control installed. Any other areas where sediment may be discharged from the site along perimeter boundaries will have perimeter control installed. Temporary Gravel Construction Accesses shall be installed off Flynn Lane as per City Standard 650. See Appendix A for the SWPPP Exhibit.

7.0 CONCLUSIONS

This drainage report has been prepared in accordance with Chapter 6 of the Missoula City Public Works Standards and Specifications Manual. This report shows that a stormwater design to infiltrate the entirety of the post-development 10-year storm and to mitigate the post-development 100-year storm is possible on-site. The proposed drywell sumps will ensure that the road is not inundated during the 10-year storm and no buildings will be inundated during the 100-year storm. Other existing drainage patterns in non-disturbed or off-site areas will be maintained. All construction will be in accordance with the Construction Plans, Montana Public Works Standard Specifications (MPWSS), and City of Missoula requirements.

Prepared by:
IMEG Corp.,

Mike Mayen, E.I.

Reviewed by:
IMEG Corp.,

Jason Rice, P.E.