

**INITIAL
STORM WATER LID SUBMITTAL
FOR
RECESS STORAGE**

**4224 HWY 12
SANTA ROSA, CA
APN (032-010-005)**

JULY 2018

Developer/Owner:
American Recess, LLC
85 Keystone Ave, Suite E
Reno, Nevada 89503
(775) 357-9206

City of Santa Rosa
SEP 04 2018
Planning & Economic
Development Department

APPLICANT/OWNER

As the Applicant/Owner, I declare that permanent storm water Best Management Practices will be installed and maintained in accordance with this document and municipal regulations.

CIVIL ENGINEER

This document was prepared by BKF Engineers to summarize storm water Best Management Practices proposed with this development. Storm water elements reflected in this document have been designed using sound engineering principals in general conformance with the municipality's guidelines.

PRELIMINARY

ERIC D. WADE, P.E. (No. C-81862)
BKF Engineers

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GENERAL INFORMATION REGARDING THE PURPOSE OF STORM WATER BMPs

Storm water runoff Best Management Practices (BMPs) are programs, processes or engineered systems designed to reduce pollutants in storm water. Temporary Best Management Practices such as straw wattle fiber rolls and silt fences are used to reduce pollutants in storm water during construction while permanent storm water Best Management Practices are intended to reduce pollutants in storm water for the life of the development following construction.

Studies suggest that approximately 85% of our annual rainfall volume is produced from the predominant population of smaller storms. Therefore, in an effort to treat storm water in a cost effective manner, storm water quality management is typically designed to target these smaller events.

The Low Impact Development Technical Design Manual

The Low Impact Development (LID) Technical Design Manual is a set of guidelines established for the Santa Rosa area and other areas around Sonoma County, which requires certain projects to incorporate sustainable LID strategies that encourage infiltration and minimize the introduction of pollutants into downstream receiving waters. The City of Santa Rosa has adopted this manual to satisfy the requirement in their municipal storm water permit.

The manual requires that a "Determination Worksheet" be prepared by the Applicant to evaluate whether or not storm water BMPs are required with each development. Developments which require BMPs that are subject to planning review through the municipality must include an "Initial Storm Water LID Submittal". The purpose of this submittal is to:

- Summarize the existing site condition and the proposed development.
- Describe storm water BMPs being incorporated into the development.
- Demonstrate by computation that the proposed measures are appropriately sized.
- Describe maintenance and funding for the BMPs.

Developments which require BMPs are required to include a final "Storm Water LID Submittal" with ministerial permit submittals such as grading, building and encroachment permits. The "final "Storm Water LID Submittal" includes all of the elements required in the "Initial Storm Water LID Submittal", maintenance measures and a maintenance agreement between the municipality and owner which assigns the responsibility for maintaining BMPs. The agreement is recorded as a covenant, runs with the land and passes with Title.

Permanent storm water Best Management Practices are categorized in the LID Technical Design Manual as being Pollution Prevention Measures, Volume Control Measures or Treatment Control Measures, which are described in the following sections of this document.

Storm Water Pollution Prevention Measures

Pollution Prevention Measures, also referred to as Source Control Measures, are practices such as street sweeping which help keep pollutants from coming into contact with storm water rather than attempting to remove pollutants after they have interacted with storm water. Educational outreach programs and stenciling storm water inlets with graphics which inform people that the storm water drains to the creek are effective Pollution Prevention Measures. Trees are another effective Pollution Prevention Measure and provide several storm water management benefits. They hold water on leaves / branches and allow water to evaporate, retaining flow and dissipating the energy of runoff. Trees also reduce the amount of water coming into contact with other impervious surfaces such as parking lots, which minimizes pollution in downstream water bodies.

Our local municipalities recognize the environmental benefit to incorporating Pollution Prevention Measures into designs and allow area offset credits with the implementation of trees which intercept falling precipitation, pervious pavements which encourage infiltration and storm water discharge through landscape areas as a pre-treatment measure. The pollution prevention offset credits reduce the size of required Volume and Treatment Control Measures.

Storm Water Volume Control Measures

Increasing the amount of impervious surface area with the development of bare land generally increases the rate which storm water flows across a site. While the impact of increasing the impervious area for a single site is often insignificant, the cumulative impact of increasing the impervious area for multiple areas may have an adverse hydromodification effect on downstream facilities, because the cumulative increase has the potential to increase runoff causing downstream erosion and sediment load in the storm water conveyance system.

In order to minimize downstream erosion and protect stream habitat, the Storm Water LID Technical Design Manual prioritizes BMPs and requires that the designer first consider measures, which capture storm water runoff from impervious surfaces and encourage infiltration. Developments in areas subject to contaminated soil or high ground water are discouraged from integrating measures, which infiltrate storm water, but they are required to incorporate alternative designs, which harvest storm water and treat runoff from impervious surfaces. If volume control measures are not feasible at the project site,

then offset projects at a different location may accomplish this requirement. In some situations, payment of an offset cost may be allowed.

Storm Water Treatment Control Measures

Treatment Control BMPs are engineered systems that are designed to remove pollutants from storm water and are often categorized as being landscape-based or mechanical. These types of BMPs are required whenever a development proposes to infiltrate less water than is discharged from new or redeveloped impervious surfaces during the target storm event.

Landscape-based treatment controls are required by most municipalities and include measures such as vegetated swales, bioretention systems, and tree wells. Mechanical treatment controls such as subsurface vaults that filter storm water through sand or engineered media are generally only allowed when used in conjunction with other landscape based BMPs.

PROJECT DESCRIPTION

American Recess is a mixed-use project, consisting of 12-unit row-house type residential dwellings and a 124,000 SF, 4 story, next generation self-storage facility. The proposed mixed-use project is located within the City of Santa Rosa along Highway 12.

The project parcel is comprised of 2.53 acres with 0-5% slopes. The existing site contains (1) 2,664 SF single family house constructed in 1948 and (2) 872 SF garages. All existing structures will be demolished. Most of the existing trees and vegetation will be removed and replaced with code compliant landscaping.

The design will follow the natural topography, preserve trees as possible and highlights the natural features of the site and the surrounding areas.

Permanent storm water Best Management Practices are required with this development because the project proposes to create or replace more than an acre of impervious surface and more than four dwelling units.

The site has been designed having positive gradients away from structures with overland relief draining to storm water capture areas during light precipitation events. The storm drain system proposed with this development is being installed as a matter of convenience to route storm water from the proposed LID features to the existing storm drain system. The existing stormdrain system drains southwest to Brush Creek, which ultimately drains to Santa Rosa Creek. Nonetheless, if the storm drain system becomes overburdened during larger storm events, storm water, which falls on site, will run overland in a southeasterly direction.

Since the finished floor of the lowest building is more than a foot above the street elevation, it is very unlikely that the buildings will experience inundation from the backwater effect of the storm drain system during design storm events.

The development proposes to integrate a series of Bioretention Areas and Permeable Pavements, which capture site runoff during light precipitation events in accordance with the LID Technical Design Manual. Storm water for larger events will be routed to a detention basin having an outlet, which limits the 100-year post development peak storm water flow rate to the predevelopment condition.

STORM WATER BMPS SELECTED FOR THIS SITE

This project will be designed to incorporate temporary, pollution prevention and permanent storm water Best Management Practices to minimize the introduction of pollutants in downstream water bodies.

Temporary Measures

A "Sediment Control Plan" will be prepared and included with the construction drawings requiring the contractor to implement temporary storm water BMPs. The contractor will be required to use filter fabric, gravel bags, straw wattles or similar measures to collect sediment and filter water before allowing its discharge to downstream facilities. Construction entrances/exits will be designated on the drawings as having a blanket of rock, where applicable, to assist with removing dirt from trucks to minimize soil tracked into the public street during the early stages of construction. This drawing will also require that disturbed areas be seeded to help stabilize un-vegetated areas. Since the project will disturb more than 1-acre with construction, a Storm Water Pollution Prevention Plan will need to be prepared which more precisely identifies temporary storm water BMPs that may be incorporated during different phases of construction.

Pollution Prevention Measures

As part of this project, storm water inlets will be stenciled with graphics, which identify that the inlets drain to the creek. The City of Santa Rosa also has a street sweeping program to help remove pollutants from public streets before pollutants have an opportunity to come into contact with storm water.

Pollution Prevention Credits

The LID Technical Design Manual allows area offset credits with the implementation of certain Pollution Prevention Measures. Although new trees will be planted with this development, creating an opportunity to intercept precipitation falling on impervious surfaces beneath them, area reduction credits were not used when assessing the size of BMP areas. However, credits may be considered when performing computations and assessing areas for the Final Storm Water Mitigation Plan. Area reduction credits for disconnected roof leaders, alternative driveway designs, and new interceptor trees are not included in this report but may be considered with the final Storm Water LID Submittal.

Permanent Volume Control Measures

The Storm Water LID Technical Design Manual requires that measures be incorporated into each site which capture storm water runoff from impervious surfaces and encourage infiltration for the life of the development following construction. The low percolation rate of Sonoma County soils does make infiltration a challenging objective. The LID manual acknowledges this, suggesting that designs incorporate engineered media and similar mechanisms which create void space to store water and allow infiltration over time. Volume control measures are generally integrated into projects to mitigate the effect of increased storm water runoff that frequently occurs with development. They are used to help emulate the predevelopment condition and are particularly useful when the amount of impervious surface is increased with development.

A series of Bioretention Areas and Permeable Pavements with porous engineered media will be incorporated into the site to capture the post development storm water runoff during light precipitation events and encourage infiltration in accordance with the LID Technical Design Manual. These areas have been equipped with overflow drains to minimize inundation of paved surfaces during larger storm events. An exhibit has been included in the body of this report which reflects the proposed geometry and location of each Bioretention Area.

A geotechnical report for the site has not been provided at the time of this report. According to the USGS Web Soil Survey the site is primarily, "Yolo clay loam" which is typically classified a class "C" type soil having an infiltration rate ~0.05-0.15 in/hr.

The "State Water Resources Control Board's "GeoTracker" system was observed and does not report groundwater contamination within 50ft of proposed storm water treatment areas.

Given that there are no reported active groundwater contamination areas beneath proposed BMP's, the integration of storm water BMPs which infiltrate water appears to be feasible with this project and it may not be necessary to integrate a subsurface liner or subdrain system. Therefore, BMPs are proposed which are in harmony with the objectives of the LID Technical Design Manual.

Soils having a Hydrologic Soil Group "C" (having an infiltration rate ~ 0.05-0.15 in/hr) were used in computations. Storm water is anticipated to infiltrate into the underlying soil very slowly over time in accordance with the objectives of the LID Technical Design Manual.

Computations were prepared to size each BMP using the City of Santa Rosa's storm water calculator to assess the post development storm water runoff volume. The design assumes bioretention areas within the private development will use Bioswale Media Mix having a porosity of at least 50%. Permeable Pavements will be underlain with AASHTO #2 stones having diameters of 1" to 3" resulting in an overall porosity of at least 40%. Computations may be observed in Appendix "B" of this document and reflect that the void space in the proposed measures exceeds the required storm water capture volume.

MAINTENANCE OF THE SELECTED PERMANENT STORM WATER BMPs

Maintenance of permanent storm water Best Management Practices is essential to ensure that the BMPs continue to function effectively and that they do not become a nuisance. An exhibit has been included in the body of this report which identifies the locations of the permanent storm water BMPs referred to in this report which will require inspection and maintenance. It is the responsibility of the Applicant/Owner to ensure that permanent storm water BMPs are installed and maintained in accordance with municipal policy until this responsibility is legally transferred.

The Regional Water Quality Control Board requires the legally responsible party to inspect and maintain permanent storm water BMPs at least once a year. A sample inspection and reporting template has been included in the Appendix of this document for reference. Reports which document maintenance activities should be completed when maintenance is performed and kept on file for a period of at least five years. These reports shall be made available to Town staff and the Regional Water Quality Control Board staff upon request.

The maintenance of permanent storm water Best Management Practices will be performed by the property owner and include but are not limited to pruning, weeding, mowing, trash removal, inspection/replacement of plants and media, the removal of sediment, permeable pavement vacuuming, excavation and replacement of bioretention

area soil, and the cleaning/replacement of subsurface drainage elements. The LID Technical Design Manual requires that the owner enter into a signed agreement and that this agreement be recorded as a perpetual covenant which runs with the land. A draft maintenance agreement has been included in the appendix of this document for reference.

Every site requires some level of maintenance such as sweeping, restriping, pavement replacement, irrigation repair and replanting. The following inspection and maintenance activities are additional measures which are necessary with this development as a result of the required permanent storm water BMPs:

- Drainage inlets will be stenciled with verbiage or a graphic which suggests that the storm water system drains to a creek. Stenciling should be refreshed every 5 years. If the BMP has been removed or has experienced significant fading, then the BMP should be replaced.
- The surface of volume capture areas should be inspected on a quarterly basis, and following larger storm events for signs of erosion, damage to vegetation, foreign debris and sediment accumulation. The BMP should be repaired to maintain its character and function in substantial conformance with the original design.
- Porous asphalt should be inspected on a semi-annual basis for signs of surface ponding and spalling. Surface ponding may occur with excessive accumulation of fine particles in the asphalt layer. Porous asphalt should be cleaned by a vacuum-assisted dry sweeper on a quarterly basis and washed using a high pressure jet hose immediately following vacuum-assisted dry sweeping, to keep asphalt pores open. Spalling and other pavement defects should be repaired in the dry months to maintain the integrity of the asphalt surface.
- Additional information has been included in the Appendices of this report which describe the function and recommended maintenance of measures proposed in this report.

Although the proposed BMPs are anticipated to provide effective treatment for more than 10-years, their life will depend on the quality of water draining to them and how well these areas are maintained. BMP maintenance and replacement should be conducted as required to ensure that their character and function are in substantial conformance with the original design.

Approximate anticipated average annual costs are summarized below to assist the Owner(s) in budgeting for BMP inspection and maintenance activities. The costs reported are predicated on these activities being conducted while performing other routine maintenance, which would ordinarily be performed on site.

Approximate Average Annual Inspection and Maintenance Costs

Inspections and Associated Paperwork	\$5,000
Stenciling Inlets	\$1,000
Permeable Pavement Sediment Removal	\$1,000
Bioretention Area Sediment Removal/Erosion Repair	\$5,000
Bioretention Area Replacement	\$15,000

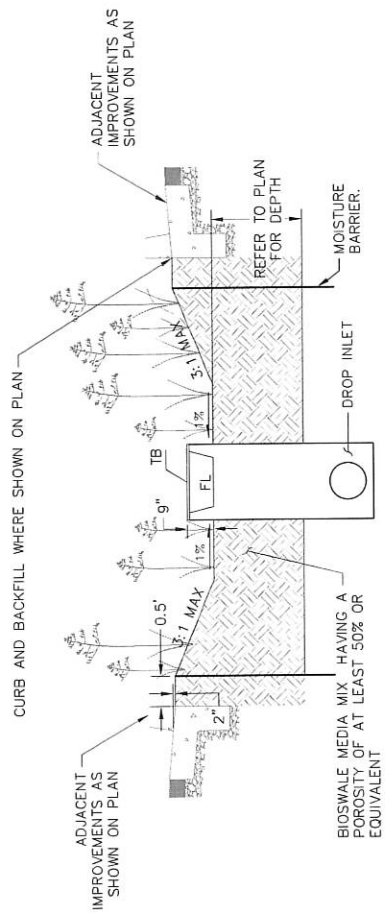
APPENDIX "A"

SITE EXHIBIT



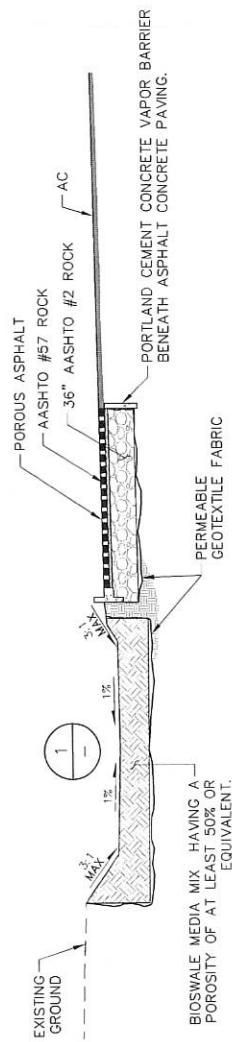
NOTE
A GEOTECHNICAL REPORT FOR THE SITE HAS NOT BEEN PROVIDED AT THE TIME OF THIS REPORT. ACCORDING TO THE USGS WEB SOIL BUNNY THE SITE IS PRIMARILY, "VLO CLAY LOAM" WHICH IS TYPICALLY CLASSIFIED A CLASS "C" TYPE SOIL HAVING AN INFILTRATION RATE $<0.05-0.15$ IN/HR.

BKF
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200 4TH ST. STE. 300 SANTA ROSA, CA 95401
(707) 583-8500 FAX: (707) 583-8539



1 BIORETENTION FACILITY

NO SCALE



2 POROUS PAVEMENT

NO SCALE

INITIAL SWLID
EXHIBIT
RECESS STORAGE

422 HWY 12
JULY 2018
CITY OF SANTA ROSA, CALIFORNIA



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(707) 543-8000 FAX (707) 543-8039

APPENDIX “B”

VOLUME CAPTURE CALCULATIONS



STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information:

Project Name:	Recess Storage
Address/Location:	4224 Hwy 12
Designer:	BKF Engineers
Date:	7/31/2018

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site:	35.00 (inches)
K=MSP/3x	1.17
Impervious area - pre development:	4,900.0 ft ²
Impervious area - post development:	74,550.0 ft ²

Based upon the pre and post development impervious area, the post construction BMP requirement is:

100% Capture & Treatment

Summary of BMPs Design: (saved data)

Requirements				Design Results								
Tributary Area		Type of Requirement Met:		Type of BMP Design		Hydromodification Control		Flow Base Treatment		Delta Volume Capture		
BMP ID:	Tributary Area (ft ²)	Runoff Reduction Measures (Y/N)				Percent Achieved	Required V _{Hydromod} (ft ³)	Achieved (ft ³)	Required Q Treatment (cfs)	Achieved Q Treatment (cfs)	Required Vdelta (ft ³)	Achieved Vdelta (ft ³)
1	29990	No	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening		100.12	1773.9084	1776.0000				
2	27930	No	Hydromod Volume Capture	Priority 2: P2-04 Roadside Bioretention - Curb Opening		106.23	1652.0594	1755.0000				
3	24045	No	Hydromod Volume Capture	Priority 3: P3-04 Roadside Bioretention - Curb Opening		119.03	1422.2617	1692.9000				
4	10580	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter		112.85	625.8070	706.2500				
5												
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STORM WATER CALCULATOR

BMP ID:
1

BMP Design Criteria:
100% Capture & Treatment

Type of BMP Design:
Priority 2: P2-04 Roadside Bioretention - Curb Opening

BMP's Physical Tributary Area:
29,990.0 ft²

Description/Notes:

Project Name:

Recess Storage

Hydromodification Requirement: 100% Volume Capture; V_{HYDROMOD}

Post development hydrologic soil type within tributary area:
C: 0.05 - 0.15 in/hr infiltration (transmission) rate

Post development ground cover description:
Residential - 2 acre lots

CN_{POST}:
95.0

User Composite post development CN:

V_{HYDROMOD} =

1,773.91 ft³

BMP Sizing Tool: Hydromodification Requirement

Post development hydrologic soil type within tributary area:
C: 0.05 - 0.15 in/hr infiltration (transmission) rate

Post development ground cover description:
Residential - 2 acre lots

CN_{POST}:
95.0

User Composite post development CN:

Percent of Goal Achieved =

100.12 %

BMP Volume Below Ground

Porosity:
0.40

Depth below perforated pipe if present:
3.00 ft

Width:
0.00 ft

Length:
0.00 ft

Area:
1,480.00 ft²

BMP Volume Above Ground

Depth:
0.00 ft

Width:
0.00 ft

Length:
0.00 ft

Area:
0.00 ft²

Release 8 Rev. 5
7/31/2018



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Recess Storage**

BMP ID: **2**

BMP Design Criteria: **100% Capture & Treatment**

Type of BMP Design: **Priority 2: P2-04 Roadside Bioretention - Curb Opening**

BMP's Physical Tributary Area: **27,930.0 ft²**

Description/Notes:

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD} =$ **1,652.06 ft³**

Post development hydrologic soil type within tributary area:

C: 0.05 - 0.15 in/hr infiltration (transmission) rate

Post development ground cover description:

Residential - 2 acre lots

CN_{POST}:

95.0

User Composite post development CN:

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = **106.23 %**

BMP Volume

Below Ground

Porosity: **0.50** ft
Depth below perforated pipe if present: **3.00** ft
Width: **0.00** ft
Length: **0.00** ft
Area: **1,170.00** ft²

Ponded Water

Above Ground

Depth: **0.00** ft
Width: **0.00** ft
Length: **0.00** ft
Area: **0.00** ft²



STORM WATER CALCULATOR

BMP Tributary Parameters		Project Name: Recess Storage	
BMP ID:	3		
BMP Design Criteria:	100% Capture & Treatment		
Type of BMP Design:	Priority 3: P3-04 Roadside Bioretention - Curb Opening		
BMP's Physical Tributary Area:	24,045.0 ft²		
Description/Notes:			

Hydromodification Requirement: 100% Volume Capture; V_{HYDROMOD}		V_{HYDROMOD} =	1,422.26 ft³
Post development hydrologic soil type within tributary area:			
Post development ground cover description:			
C: 0.05 - 0.15 in/hr infiltration (transmission) rate			
Residential - 2 acre lots			
CN _{POST} :			
User Composite post development CN:	95.0		

BMP Sizing Tool: Hydromodification Requirement		Percent of Goal Achieved =		119.03 %
BMP Volume Below Ground		Ponded Water Above Ground		
Porosity:	0.38	Depth:	0.00	ft
Depth below perforated pipe if present:	3.00	Width:	0.00	ft
Width:	0.00	Length:	0.00	ft
Length:	0.00	Area:	0.00	ft²
Area:	1,485.00			



STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Recess Storage**

BMP ID: **4**

BMP Design Criteria: **100% Capture & Treatment**

Type of BMP Design: **Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter**

BMP's Physical Tributary Area: **10,580.0 ft²**

Description/Notes:

Hydromodification Requirement: 100% Volume Capture; V_{HYDROMOD}

V_{HYDROMOD} = **625.81 ft³**

Post development hydrologic soil type within tributary area: **C: 0.05 - 0.15 in/hr infiltration (transmission) rate**

Post development ground cover description: **Residential - 2 acre lots**

CN_{POST}:

User Composite post development CN: **95.0**

BMP Sizing Tool: Hydromodification Requirement

BMP Volume

Below Ground

Porosity: **0.50**

Depth below perforated pipe if present: **2.50 ft**

Width: **0.00 ft**

Length: **0.00 ft**

Area: **565.00 ft²**

Ponded Water

Above Ground

Depth: **0.00 ft**

Width: **0.00 ft**

Length: **0.00 ft**

Area: **0.00 ft²**

Percent of Goal Achieved = **112.85 %**

APPENDIX “C”

DETERMINATION WORKSHEET

SUSMP SUBMITTAL GUIDE CHECKLIST

BMP SELECTION TABLES

FOR OFFICE USE ONLY:

Does this project require permanent storm water BMP's?

☐ Y ☐ N

Date Submitted: _____



Print Form

File No:	Quadrant
Related Files:	
Set:	
Department Use Only	

2017 Storm Water LID Determination Worksheet

PURPOSE AND APPLICABILITY: This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Part 1: Project Information

Recess Storage

Larry Thom

Project Name

Applicant (owner or developer) Name

4224 Hwy 12

85 Keystone Ave, Suite E

Project Site Address

Applicant Mailing Address

Santa Rosa/CA/ 95492

Reno NV 89503

Project City/State/Zip

Applicant City/State/Zip

(775) 357-9206/Larry@arecess.com

Permit Number(s) - (if applicable)

Applicant Phone/Email/Fax

BKF Engineers

200 4th Street, Suite 300

Designer Name

Designer Mailing Address

Santa Rosa/CA/95409

(707)583-8513 / ewade@bkf.com

Designer City/State/Zip

Designer Phone/Email

Type of Application/Project:

☐ Subdivision
 ☐ Grading Permit
 ☐ Building Permit
 ☐ Hillside Development
☒ Design Review
 ☐ Use Permit
 ☐ Encroachment
 ☐ Time Extensions
 ☐ Other : _____

PART 2: Project Exemptions

1. Is this a project that creates or replaces *less than 10,000 square feet of impervious surface¹*, including all project phases and off-site improvements?

☐ Yes
 ☒ No

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2017 Storm Water LID Determination Worksheet

Recess Storage

2. Is this project a routine maintenance activity² that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots?

☐ Yes ☒ No

3. Is this project a stand alone pedestrian pathway, trail or off-street bike lane?

☐ Yes ☒ No

4. Did you answer "YES" to any of the questions in Part 2?

☐ **YES:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete the "Exemption Signature Section" on Page 4.**

☒ **NO:** Please complete the remainder of this worksheet.

Part 3: Project Triggers**Projects that Trigger Requirements:**

Please answer the following questions to determine whether this project requires permanent Storm Water BMP's and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.

1. Does this project create or replace a combined total of 10,000 square feet or more of impervious surface¹ including all project phases and off-site improvements?

☒ Yes ☐ No

2. Does this project create or replace a combined total of 10,000 square feet or more of impervious streets, roads, highways, or freeway construction or reconstruction³? ☐ Yes ☒ No

3. Does this project create or replace a combined total of 1.0 acre or more of impervious surface¹ including all project phases and off-site improvements? ☒ Yes ☐ No

4. Did you answer "YES" to any of the above questions in Part 3?

☒ **YES:** This project will need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete remainder of worksheet and sign the "Acknowledgement Signature Section" on Page 4.**

☐ **NO:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 permit. **Please complete the "Exemption Signature Section" on Page 4.**

¹ Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

² "Routine Maintenance Activity" includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities per section VI.D.2.b.

³ "Reconstruction" is defined as work that extends into the subgrade of a pavement per section VI.D.2.b.

Part 4: Project Description

1. Total Project area: 2.15

☐ square feet
☒ acres

2. Existing land use(s): (check all that apply)

☐ Commercial ☐ Industrial ☒ Residential ☐ Public ☐ Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

Currently, the property located at 4224 Hwy 12, Santa Rosa, CA 95409, is under the County of Sonoma jurisdiction with County Zoning RR B6 20, VOH. The site is comprised of 2.15 acres and contains (1) 2,664 SF single family house constructed in 1948 and (2) 872 SF garages with no significant site features. All existing structures will be demolished.

3. Existing impervious surface area: 0.1

☐ square feet
☒ acres

4. Proposed Land Use(s): (check all that apply)

☐ Commercial ☐ Industrial ☒ Residential ☐ Public ☐ Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

A mixed use, consisting of 12 units row-house type residential dwellings and a 124,000 SF, 4 story, next generation self-storage facility, is proposed. An annexation into the City of Santa Rosa with CG (General Commercial) zoning is proposed.

5. ~~Existing~~ Proposed impervious surface area: 1.7☐ square feet
☒ acres

Acknowledgment Signature Section:

As the property owner or developer, I understand that this project is required to implement permanent Storm Water Best Management Practices and provide a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit Order No. R1-2015-0030. *Any unknown responses must be resolved to determine if the project is subject to these requirements.

Applicant Signature_____
Date**Exemption Signature Section:**

As the property owner or developer, I understand that this project as currently designed does not require permanent Storm Water BMP's nor the submittal of a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit*. I understand that redesign may require submittal of a new Determination Worksheet and may require permanent Storm Water BMP's.

Applicant Signature_____
Date

* This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Implementation Requirements: All calculations shall be completed using the "Storm Water Calculator" available at: www.srcity.org/stormwaterLID

Hydromodification Control/100% Volume Capture: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

Treatment Requirement: Treatment of 100% of the flow calculated using the modified Rational Method and a known intensity of 0.20 inches per hour.

Delta Volume Capture Requirement: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

Project Name: Recess Storage

Date: 07/31/18



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

1. Submittal Information:

Submittal Date: 07/31/2018

Initial SW LIDS ☒ Final SW LIDS ☐

Design Manuel Used for design:

- ☐ 2005 Standard Urban Storm Water Mitigation Plan
- ☐ 2011 Storm Water Low Impact Development Technical Design
- ☒ Manuel 2017 Storm Water Low Impact Development Technical Design Manuel

2. Applicant Information:

Applicant Name (Owner or Developer): Larry Thom

Mailing Address: 85 Keystone Ave, Suite E

City/State/Zip: Reno/NV/89503

Phone/Email/Fax: (775) 357-9206/Larry@arecess.com

Project Name: Recess Storage

Date: 07/31/18

Storm Water Low Impact Development Submittal Coversheet

Recess Storage

4224 Hwy 12

Santa Rosa/ CA 95492

032-010-005

☐☐☐☒☐☐☐☐

Project Name: Recess Storage

Date: 07/31/18



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

4. Design Information:

Narrative:

Project Description

- ☒ Description of proposed project type, size, location, and any specific uses or features.
- ☒ Description of any sensitive features (creeks, wetlands, trees, etc.) and whether they are going to be preserved, removed or altered.
- ☒ Description of the existing site.
- ☒ Description of how this project triggers these requirements (impervious area, CALGreen, 401 Permit, etc.).
- ☒ Describe any "on-site offset" used.

Pollution Prevention and Runoff Reduction Measures

- ☒ Description of all proposed pollution prevention measures (street sweeping, covered trash enclosures, indoor uses, etc).
- ☒ Description of all Runoff Reduction Measures (Interceptor Trees, Impervious Area Disconnection, and/or Alternative Driveway Design).

Type of BMPs Proposed

- ☒ Description of the types of BMPs selected including priority group that each is in.
- ☒ Description of level of treatment and volume capture achieved for each BMP.

Maintenance

- ☒ Description of maintenance for each type of BMP.
- ☒ Description of funding mechanism.
- ☒ Designation of Responsible Party.

Project Name: Recess Storage

Date: 07/31/18



Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

Exhibits:

Proposed SUSMP Exhibit:

- ☒ Exhibit should include: street names, property lines, storm drainage system, waterways, title block, scale and north arrow.
- ☒ Tributary areas shown for all inlets (including off-site drainage areas).
- ☒ C value for each tributary area.
- ☒ Soil Type of existing site.
- ☒ New or replaced impervious area shown.
- ☒ All inlets and BMP, shown (including unique identifier).
- ☐ All interceptor trees shown.
- ☒ All proposed BMPs shown including dimensions.

Existing Condition Exhibit

- ☒ Exhibit should include: street names, property lines, proposed storm drainage system, waterways, title block, scale, and north arrow.
- ☒ Soil Type of existing site.
- ☒ Proposed tributary areas shown for all proposed inlets (including offsite drainage areas). Existing impervious areas.
- ☒ Existing impervious area.

BMP Details:

- ☒ Preliminary detail for each type of BMP selected- provide a preliminary 8.5"x11" detail for each BMP type or include on submitted drawings. These can be taken straight from the Fact Sheets if no significant changes are proposed.

On Plans:

- ☒ Show all applicable elements of the selected BMPs on the appropriate plan sheets.

Calculations:

- ☒ Calculations and summary sheet using the Storm Water Calculator found at www.srcity.org/stormwaterLID
- ☒ Supplemental or supporting calculation if applicable.
- ☐ Calculations; from the "storm water calculator" for each inlet.

Project Name: _____

Project Name: _____														
Universal BMP- to be considered on all projects.	Best Management Practice (BMP)	Detail Sheet	Detail Title											
	Living Roof Rainwater Harvesting	N/A	N/A											
		N/A	N/A											

Runoff Reduction Measures	Interceptor Trees	N/A	N/A	X	X	X			X											
	Bovine Terrace	RRM-01	Bovine Terrace	X					X											
	Vegetated Buffer Strip	RRM-02	Vegetated Buffer Strip						X											
	Impervious Area Disconnection	N/A	N/A	X	X	X			X											

Priority 1- to be installed with no underdrains or liners. Must drain all stading water within 72 hours.	Bioretention	P1-02	Roadside Bioretention - no C & G				X	X												
	Vegetated Swale- with Bioretention	P1-06	Swale with Bioretention				X	X												
	Constructed Wetlands	N/A	N/A				X	X												

Priority 2 BMPs- with subsurface drains installed above the capture volume.	Bioretention	P2-02	Roadside Bioretention - Flush Design Roadside				X	X												
		P2-03	Roadside Bioretention- Contiguous SW				X	X												
		P2-04	Roadside Bioretention- Curb Opening				X	X												
		P2-05	Roadside Bioretention- No C & G				X	X												
	Constructed Wetlands	N/A	N/A				X	X												

Notes:

Interceptor trees may be incorporated into the project because they fit into the context of this site.

Roadside Bioretention and vegetated swale with Bioretention will be incorporated into the project because it fits into the context of this site.

Porous pavement will be incorporated into the project.

Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with				Achieves		Treatment		Volume capture		BMP in priority selected?		Unique Identifier of BMP per Planes		Explanation of selection	Other notes:
			High Ground Water		Slope Constraints		Slope Constraints		Runoff Reduction Measure		Runoff Reduction Measure		Yes		No			
Priority 3 BMPs- installed with subdrains and/or impermeable liner. Does not achieve volume capture and must be used as part of a treatment train.	Bioretention	Roadside Bioretention - Flush Design	X	X	X	X	X	X	X	X	X	X	X					
		Roadside Bioretention- Contiguous SW	X	X	X	X	X	X	X	X	X	X	X					
		Roadside Bioretention- Curb Opening	X	X	X	X	X	X	X	X	X	X	X					
	Flow Through Planters	Flow Through Planters	X	X	X	X	X	X	X	X	X	X	X					
		Flow Through Planters With	X	X	X	X	X	X	X	X	X	X	X					
	Vegetated Swale	Vegetated Swale	X	X	X	X	X	X	X	X	X	X	X					
		Vegetated Swale	X	X	X	X	X	X	X	X	X	X	X					
Priority 4 BMPs- does not achieve volume capture and must be used as part of a	Tree Filter Unit		X	X	X	X	X	X	X	X	X	X						
	Modular Bioretention		X	X	X	X	X	X	X	X	X	X						
Priority 5 BMPs- does not achieve volume capture and must be used as part of a treatment train.	Chambered Separator Units		X	X	X	X	X	X	X	X	X	X						
	Centrifugal Separator Units		X	X	X	X	X	X	X	X	X	X						
	Trash Excluders		X	X	X	X	X	X	X	X	X	X						
	Filter Inserts		X	X	X	X	X	X	X	X	X	X						
Priority 6 BMPs- see the "Offset Program" chapter for details.	Offset Program																	
Other	Detention		X															

Notes:

Interceptor trees may be incorporated into the project because they fit into the context of this site.

Roadside Bioretention and vegetated swale with Bioretention will be incorporated into the project because it fits into the context of this site.

Porous pavement will be incorporated into the project.

APPENDIX "D"

BIORETENTION AREA FACT SHEET

VEGETATED SWALE FACT SHEET

POROUS PAVEMENT FACT SHEET

FACT SHEET- BIORETENTION

BIORETENTION

Also known as: Rain garden, roadside bioretention, and bioretention cell



DESCRIPTION

The bioretention area best management practice (BMP) functions as a soil and plant-based filtration and infiltration feature that removes pollutants through a variety of natural physical, biological, and chemical treatment processes.

ADVANTAGES

- Can be designed to achieve Treatment, Delta Volume Capture, or Hydromodification requirements.
- Enhances water quality of downstream water bodies through natural processes.
- Aesthetically pleasing.
- The vegetation can provide shade and wind breaks, absorbs noise, reduces heat island effects and improves an area's landscape.
- Provides habitat for birds and attracts other pollinators like butterflies and bees.
- Does not interrupt utility installation.
- Does not interfere with tree planting.

FACT SHEET- BIORETENTION

LIMITATIONS

- Specialized design is required for areas where street slopes exceed 10%.
- Should not be used in areas of known contamination. If soil and/or groundwater contamination is present on the site or within a 100' radius of the proposed BMP location, the North Coast Regional Water Quality Control Board will need to be contacted and the site reviewed.
- Should not be used in areas of high groundwater. In general a minimum of 2' of clearance should be provided between the bottom of the bioretention cell and seasonal high groundwater.
- Should not be used in areas of slope instability where infiltrated storm water may cause failure. Slope stability should be determined by a licensed geotechnical engineer.
- Do not use in locations that can negatively impact building foundation or footings. Location shall be approved by a licensed Geotechnical Engineer.

KEY DESIGN FEATURES

ALL BIORETENTION

- Structural soil should be used within the bioretention area requiring load bearing capacity (adjacent to roadways and/or buildings).
- Structural soil, if used, shall be installed as described in Appendix E.
- Some BMPs may not require the use of structural soil and a more organic type planting soil and/or treatment media may be used in its place. It may be possible in some cases to use native soil or to amend the native soil so that it is suitable. Use of non-structural soil will depend on evaluation of the criteria in "Chapter 4-Site Assessment" as well as consideration of structural needs and may require evaluation by a licensed Geotechnical Engineer.
- Underlying native soil should remain un-compacted to preserve infiltration capacity. Fence off the area during construction to protect it from compaction.
- Bottom of bioretention should be un-lined to allow infiltration into native soil.
- Moisture barrier must be installed vertically to protect road sub-base and any trenches adjacent to the bioretention area.
- If used, pervious concrete shall be designed and installed as described in Appendix E and protected during construction to prevent sediment loading.
- If the porous gutter design option is used additional trash and sediment capture BMPs is required.
- A curb opening type design may be used in place of a porous gutter if appropriate for the project and does not require additional trash capture.
- Bioretention areas shall be planted with plants from the approved **Plant List** and **Tree List** included in Appendix F and shall be planted to achieve 51% cover.
- All bioretention areas shall be designed with a designated high flow bypass inlet for storms larger than the design storm.

FACT SHEET- BIORETENTION

- For designs that include perforated pipe, the 6" perforated pipe must be installed a minimum of 6" below the adjacent road structural section.
- Perforated pipe shall be installed in straight runs only.
- The volume below the perforated pipe must be sufficient to hold and infiltrate the design volume.

SIZING DESIGN- GOAL AND REQUIREMENTS

- **For all projects:** The treatment component requires that all of the runoff generated by this water quality design storm from impermeable surfaces must be treated on site for the pollutants of concern.
- ***For projects that increase the amount of impervious surface, but create or replace less than a total of one acre:*** The **Delta Volume Capture** component requires that any increase in volume due to development for the water quality design storm must be infiltrated and/or reused on site. Further discussion of the Treatment and Delta Volume Capture requirements and the accompanying formulas can be found in Chapter 6.
- ***For projects that create or replace one acre or more of impervious surface:*** These larger projects must mitigate their impacts by meeting the **Hydromodification Requirement** by capturing 100% of the post development volume generated by the water quality rain event.
- All calculations shall be completed using the "Storm Water Calculator" available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SWLID Submittal. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist.

At a minimum maintenance shall include the following:

- Dry street sweeping upon completion of construction
- Dry street sweeping annually, and
 - When water is observed flowing in the gutter during a low intensity storm.
 - Algae is observed in the gutter.
 - Sediment/debris covers 1/3 of the gutter width or more.
- Inspect twice annually for sedimentation and trash accumulation in the gutter. Obstructions and trash shall be removed and properly disposed of.
- Inspect twice during the rainy season for ponded water.
- Pesticides and fertilizers shall not be used in the bioretention area.
- Plants should be pruned, weeds pulled and dead plants replaced as needed.

FACT SHEET- POROUS PAVEMENT

POROUS PAVEMENT

Also known as: Unit Pavers, Porous Concrete, and Pervious Pavement



DESCRIPTION

Porous Pavement is a system comprised of load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration or drainage to a controlled outlet. The surface can be porous such that water infiltrates across the entire surface of the material (e.g., crushed aggregate, porous concrete and porous asphalt), or it can be constructed of impermeable blocks separated by spaces and joints, through which the water can drain. This latter system is termed 'permeable' paving. Pervious paving is used for light vehicle loading in parking areas. For a surface to be considered porous it must allow water to infiltrate in to the soil below. Perforated pipe may be installed high in the section and the volume below the perforated pipe may be counted toward volume capture if no impermeable liner is installed. Sections with perforated pipe or liners at the bottom provide treatment only.

ADVANTAGES

- Significant flow attenuation and improvement in water quality.
- Can remove both the soluble and fine particulate pollutants.
- Roof runoff can be piped into the subsurface storage area directly, which would increase the level of flow attenuation.
- Within lined systems, there is the opportunity for stored runoff to be piped out for reuse.
- Pervious pavements have a high level of applicability because they are unobtrusive.

FACT SHEET- POROUS PAVEMENT

LIMITATIONS

- Can become clogged if improperly installed or maintained. However, this problem is minimized by the ease with which small areas of paving can be cleaned or replaced when blocked or damaged.
- Use should be limited to car parking areas and other lightly trafficked or nontrafficked areas. Pervious surfaces are currently not considered suitable for roadways within the public right-of-way.
- Prohibited in areas of known contamination. If soil and/or groundwater contamination is present on the site or within a 100' radius of the proposed location, the North Coast Regional Board review and approval is required.
- Do not use in areas of slope instability where infiltrated storm water may cause failure. Slope stability shall be determined by a licensed Geotechnical Engineer.
- Do not use in locations that can negatively impact building foundation or footings. Location shall be approved by a licensed Geotechnical Engineer.

KEY DESIGN FEATURES

- The subgrade should be able to sustain traffic loading without excessive deformation.
- The granular capping and sub-base layers should give sufficient load-bearing to provide an adequate construction platform and base for the overlying pavement layers.
- Pervious pavements require a single size grading to create voids for infiltration. The choice of materials is therefore a compromise between stiffness, permeability and storage capacity.
- Because the sub-base and capping will be in contact with water for extended periods, the strength and durability of the aggregate particles when saturated and subjected to wetting and drying should be assessed.
- Pervious concrete shall be designed and installed as described by the current version of CalTrans "Pervious Pavement Design Guidance."
- Must be installed under the supervision of a Certified Craftsman level contractor.



SIZING DESIGN- GOAL AND REQUIREMENTS

- **For all projects:** The treatment component requires that all of the runoff generated by this water quality design storm from impermeable surfaces must be treated on site for the pollutants of concern.
- **For projects that increase the amount of impervious surface, but create or replace less than a total of one acre:** The **Delta Volume Capture** component requires that any increase in volume due to development for the water quality design storm must be

FACT SHEET- POROUS PAVEMENT

infiltrated and/or reused on site. Further discussion of the Treatment and Delta Volume Capture requirements and the accompanying formulas can be found in Chapter 6.

- ***For projects that create or replace one acre or more of impervious surface:*** These larger projects must mitigate their impacts by meeting the **Hydromodification Requirement** by capturing 100% of the post development volume generated by the water quality rain event.
- All calculations shall be completed using the “Storm Water Calculator” available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SW LID Submittal. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist.

At a minimum inspection and maintenance shall include the following:

- Keep landscaped areas well maintained
- Prevent soil from washing onto pavement

Pervious Pavement shall be inspected and maintained 2-3 times per year:

a) Vacuum clean surface using commercial sweeping machines at the following times:

- End of winter (April)
- Mid-summer (July / August)
- After autumn leaf-fall (November)
- Inspect outlets annually

b) As needed maintenance:

- If routine cleaning does not restore infiltration rates, then reconstruction of part of the pervious surface may be required.
- The surface area affected by hydraulic failure should be lifted for inspection of the internal materials to identify the location and extent of the blockage.
- Surface materials should be lifted and replaced after brush cleaning. Geotextiles, if used, may need complete replacement.
- Sub-surface layers may need cleaning and replacing.
- Due to the accumulation of pollutants, removed silts may need to be disposed of as controlled waste.

APPENDIX “E”

SAMPLE OPERATION AND MAINTENANCE INSPECTION CHECKLISTS

Page ____ of ____

Date: _____

Inspector: _____

Project: _____

Address: _____

[illegible]