

WAKE COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER PERMIT

NO PERMIT(S) FOR CONSTRUCTION, LOCATION OR RELOCATION ACTIVITY SHALL BE ISSUED UNTIL AN AUTHORIZATION FOR WASTEWATER SYSTEM CONSTRUCTION AUTHORIZATION HAS BEEN ISSUED

PERMIT VOID IF NOT IN COMPLIANCE WITH ZONING REGULATIONS AND/OR IF SITE IS ALTERED OR INTENDED USE CHANGED

OPERATIONS PERMIT

PERMIT # WRP-026251-2019

APPLICATION DATE: 09/30/2019

BLDG. PERMIT#: RBPR-026213-2019

PIN: 1719873863

RECORDED: Yes

TOWNSHIP: 02 - Bartons Creek

JURISDICTION: Wake County

ZONING: R-80W

APPLICANT: Tall Tradition Building
Richard Tilley
8916 Lindenshire RD

BUSINESS PHONE: (919) 427-6284

HOME PHONE:

MOBILE PHONE: (919) 427-6284

HD USE: 101A CONVENTIONAL ONE-FAMILY HOUSE

EXISTING USE:

SITE ADDRESS: 1421 ALPINE CREEK DR

SUBDIVISION: ALPINE CREEK ESTATES

LOT: 18

ACRES: 2.11

DIRECTIONS: Falls of Neuse north to left on Raven ridge 2 miles turn right on Hardie Rd. 1/4 mile turn right on Alpine Creek Drive. Entry code is #7420. Lot 18 is at end of road in cul de sac.

Systems defined as either type III-b, III-g with a pump, IV, V or VI, in accordance with the North Carolina administrative code 15A NCAC 18a .1961, table V as adopted by reference in the "Regulations Governing Wastewater Treatment Dispersal Systems in Wake County", requires Wake County Environmental Services to conduct periodic inspections of the system type pursuant to 15A NCAC 18a. 1961 (j). Fees for these inspections will be charged as per the approved Fee Schedule. In addition, all systems are to be operated and maintained as specified in 15A NCAC 18A .1961. This permit is based in part on information provided by the homeowner and/or his/her representative in the application submitted for this permit. The Environmental Health Specialist is not responsible for false or misleading information contained in the application. The environmental health specialist is also not responsible for concealed conditions on the property or for statements in this report that may have resulted from false or misleading statements provided to him/her in the application. Neither Wake County nor the Environmental Health Specialist warrants that the septic tank system will continue to function satisfactorily in the future or that the water supply will remain potable.

OPERATION PERMIT VALID FOR: No Expiration

INSTALLED BY: BRANTLEY, CORY - 1036 - IV

PROPRIETARY SYSTEM: EZ1203HG - EZFlow EZ 1203H Geo **PRETREATMENT SYSTEM:**

SYSTEM TYPE INSTALLED: III B

OPERATION PERMIT: STATUS: Issued

ISSUED BY: Jeremy Davis

ISSUED DATE: 11/20/2020

SEPTIC TANK: David Brantley & Sons - STB-322 - 1500 gallons **DATE OF MANUFACTURE:** 09/26/2019 **FILTER:** GAG SIM/TECH - STF-110

GREASE TRAP:

DATE OF MANUFACTURE:

FILTER:

DOSING PUMP TANK: Brantley - PT-293 - 1500 gal - 30.65 gal/in

DATE OF MANUFACTURE: 03/12/2020

FILTER:

CC1: 999,807

ETM1: 24

CC2:

ETM2:

RECIRCULATION TANK:

DATE OF MANUFACTURE:

CC1:

ETM1:

CC2:

ETM2:

SEPTIC TANK ELEVATION: 5.50

GREASE TRAP ELEVATION:

DOSING PUMP TANK ELEVATION: 5.75

RECIRCULATION TANK ELEVATION:

DISTRIBUTION DEVICE ELEVATION: 4

INSTALLED TRENCH DEPTH	INSTALLED AGGREGATE DEPTH	INSTALLED TRENCH LENGTH	INSTALLED TRENCH BOTTOM ELEVATION
18	12	70	6.33
18	12	65	7.91
18	12	60	9.08
18	12	55	10.08
18	12	50	10.66
18	12	50	11.58
18	12	75	12.33

ACTUAL PRESSURE HEAD: 2

ACTUAL FLOW RATE: 44

ACTUAL DOSE VOLUME: 215

SPECIFIC OPERATION REQUIREMENTS:

ADSMS: Book-14978 Page-171

-Pump installed: NF55

-Site serviced by private well water.

-System designed for 5 bedroom home, having 480 gals per day (using Engineer Flow Reduction).

ISSUED BY:



DATE: 11/20/2020

PROPOSED PLOT PLAN FOR:
**TALL TRADITIONS BUILDING
COMPANY LLC**

LOT 18
ALPINE CREEK
BOOK OF MAPS 2019 PAGE 1408,
PIN: 1788-87-3863
BARTONS CREEK TOWNSHIP
WAKE COUNTY, NORTH CAROLINA
ADDRESS: 1421 ALPINE CREEK DRIVE

RBPR-026213-2019

REFERENCES

1. B.M. 2019 PG 1408
2. WAKE COUNTY GIS.

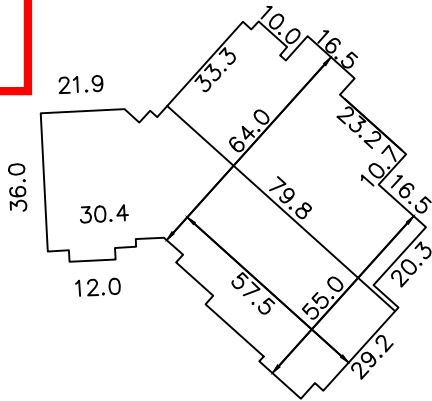
PROPOSED IMPERVIOUS
DWELLING _____ 5,403 SF
CONCRETE _____ 4,804 SF
TOTAL _____ 11,372 SF
85% OF ALLOWABLE IS PROPOSED



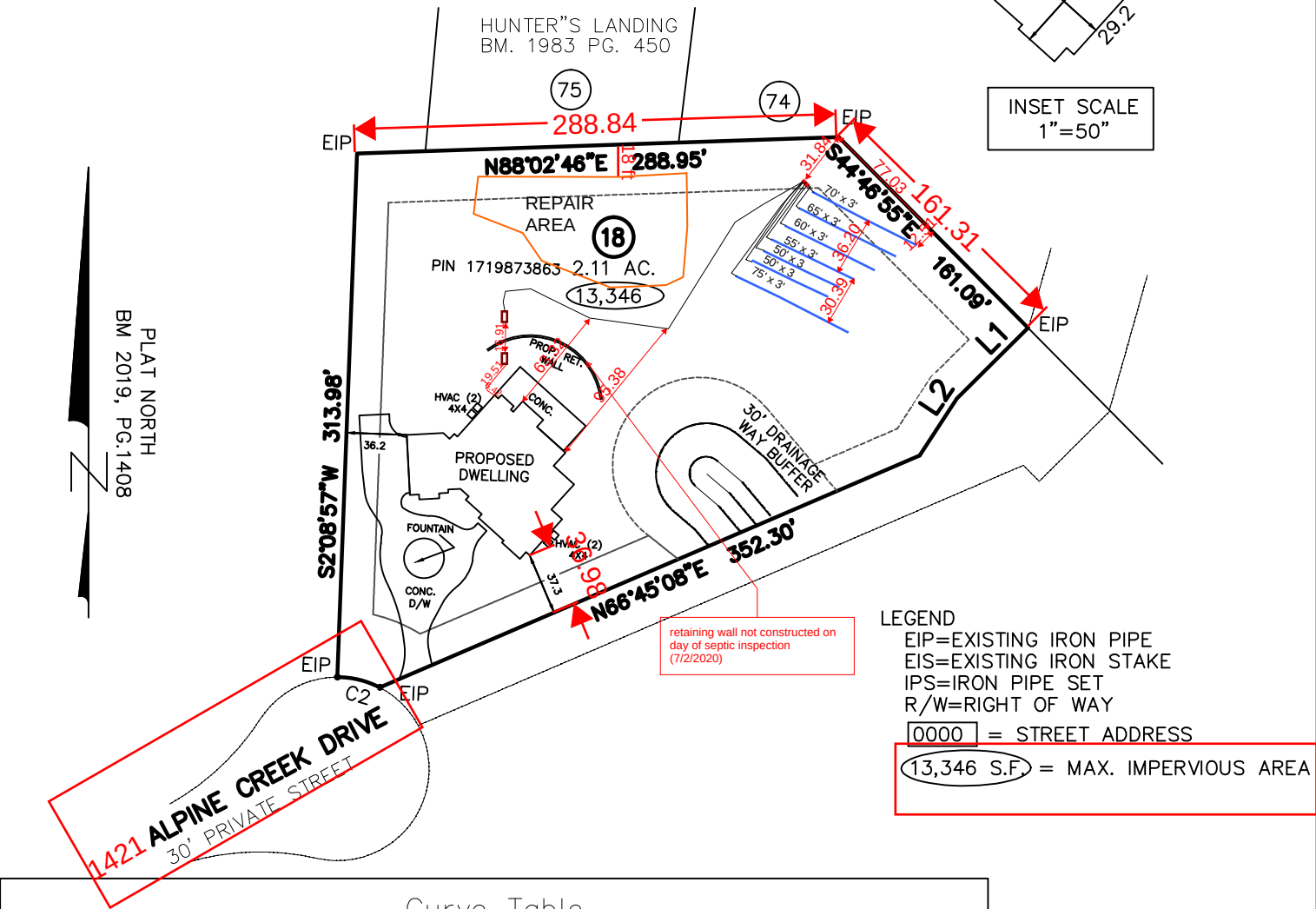
Required Setbacks

Front 40
Side 20
Rear 30
Corner

- NOTES**
1. AREA BY COORDINATE CALCULATION.
 2. PROPERTY IS SUBJECT TO ALL EASEMENTS AND RIGHT-OF-WAYS OF RECORD PRIOR TO THE DATE OF
 3. NO GRID MONUMENTS FOUND WITHIN 2000' OF PROPERTY.
 4. THIS PLAT IS A CORRECT REPRESENTATION OF THE LAND PLATTED AND HAS BEEN PREPARED IN CONFORMITY WITH NORTH CAROLINA STANDARDS, GS47-30, AND REQUIREMENTS OF LAW, BUT A NORTH CAROLINA LICENSED ATTORNEY-AT-LAW SHOULD BE CONSULTED REGARDING CORRECT OWNERSHIP, WIDTH AND OWNERSHIP OF EASEMENTS AND OTHER TITLE QUESTIONS REVEALED BY A TITLE EXAMINATION.



INSET SCALE
1"=50"



- LEGEND**
- EIP=EXISTING IRON PIPE
EIS=EXISTING IRON STAKE
IPS=IRON PIPE SET
R/W=RIGHT OF WAY
0000 = STREET ADDRESS
13,346 S.F. = MAX. IMPERVIOUS AREA

Curve Table

CURVE #	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C2	27°29'26"	55.00	26.39	N76°15'08"W	26.14

LINE TABLE

LINE #	BEARING	LENGTH
L1	N45° 13' 08.81"E	59.94
L2	N33° 13' 44.59"E	40.89

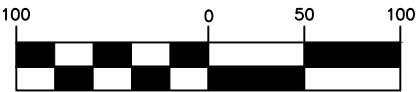
THIS PROPERTY IS NOT LOCATED IN A
F.E.M.A. 100 YEAR FLOOD HAZARD AREA.
REFERENCE: F.E.M.A. COMMUNITY PANEL NO. 3720078800 J
EFFECTIVE DATE: 05/02/2006

STEWART-PROCTOR
ENGINEERING and SURVEYING
319 CHAPANOKE ROAD, SUITE 106
RALEIGH, NC 27603 (LICENSE # P-0148)
TEL. 919 779-1855 FAX 919 779-1661

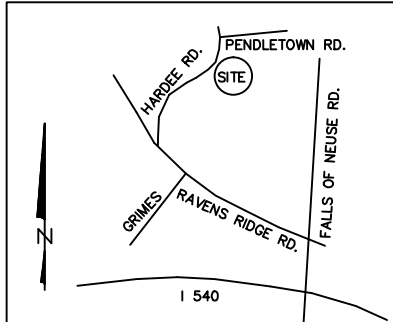
DATE 09/17/19 DRAWING

SCALE 1"=100' Lot 18 plot plan

GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.



VICINITY MAP (no scale)

BOOK: 018197 PAGE: 01513 - 01513

ALTERNATIVE SEWAGE DISPOSAL SYSTEM MAINTENANCE SCHEDULE

To Be Recorded In The Register Of Deeds Office In Wake County.

Owner/Grantor Craig W Adams - Owner Deedbook and Page 14978 - 171
 PIN No. 1719873843 Date Installed 7-15-2020
 Subdivision Name Alpine Creek Estates Lot No. 18
 System Designed by CCSC, PLLC Installer David Brantley & Sons

AN ALTERNATIVE OR NON-TRADITIONAL SEWAGE DISPOSAL SYSTEM USING AN ENGINEER DESIGNED FLOW RATE MODIFICATION PURSUANT TO SESSION LAW 2014-120 SECTION 53 HAS BEEN INSTALLED ON THIS PROPERTY.

The design specifications and locations for alternative sewage disposal systems are specified or authorized in Regulations Governing Wastewater Treatment and Dispersal in Wake County effective November 21, 1988, amended effective May 23, 2002, amended October 27, 2011.

As A Condition Of Issuance Of This Improvements/Operation Permit, The Property Owner Hereby Grants The Wake County Department Of Environmental Services A Right Of Access To The System During Regular Working Hours For Purposes Of Monitoring Compliance With State And Local Regulations, Recorded Maintenance Agreements And Certified Operator Compliance.

This permit requires the use of pressure manifold distribution to a mode of subsurface wastewater dispersal. Experience and study have shown that pressure manifold systems require routine maintenance in order to function satisfactorily. In as much as each system must be individually designed and sited, special maintenance requirements may apply to a specific installation; however, the following maintenance schedule is applicable to all pressure manifold systems. This permit also requires the use of pre-treatment and a mode of subsurface wastewater dispersal for the repair system, which will require a contract with a Certified Operator to perform maintenance on the system as described in the above referenced regulations. Due to this requirement, the initial system must be inspected by a certified inspector or operator at a frequency of at least once every five years and a report submitted. For additional information, technical assistance or if a malfunction of the system occurs, contact the Wake County Department of Environmental Services, Telephone: 919-856-7400.

System Component	Frequency	Maintenance
1. Septic Tank	6-12 months 1-3 years	Check riser condition (must be accessible from ground surface), excess infiltration, entry of water at riser, and solids accumulation. Pump septage
2. Pump/Dosing Tank	6-12 months	Check riser conditions (must be accessible from ground surface), excess infiltration, entry of water at riser, and solids accumulation. Pump sludge accumulation as required and when septic tank is pumped. Check pump(s), controls, floats, electrical connections, and alarm for proper operation. Wash (hose) sludge accumulation from pump housing.
3. Supply lines	6-12 months	Check for settling, pipe exposure and leakage. Includes Manifold(s).
4. Drain Field(s)	1-4 weeks 6-12 months	Maintain vegetative cover (mow grass and remove weeds and brush). Check for settling, erosion and surfacing of effluent. Check site drainage, eliminate low or settled areas and divert surface or shallow groundwater movement around fields.
5. Pressure Manifold	6-12 months	Check and reset pressure head, flush sludge from pressure manifold (any discharge sludge and effluent is to be treated with a chlorine solution).
6. Sampling	12 Months	Influent and Effluent sampling may be required once per year to ensure adherence to domestic strength wastewater standards.
7. General	At all times	Prohibit vehicular or equipment traffic on ground absorption field. Prohibit tillage (gardening) or other soil disturbance over ground absorption field. Practice water conservation to reduce waste water load on system. Do not permit entry of grease and non-domestic waste to system. Use of a garbage disposal is prohibited. Addition of chemical or biological additives has <u>not</u> been demonstrated to be necessary to maintain proper system function. Prevention of root intervention on lateral lines and trenches may be necessary on certain sites. Surface and groundwater diversion structures must be maintained. <u>Adherence to permitted flow rate.</u>

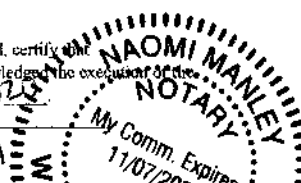
This system is permitted under S.L. 2014-120 for engineer flow reduction utilizing low flow fixtures and technologies, all of which must remain in use for the life of the applicable system. Neither the State nor any local government shall be liable for any damages by a system approved or permitted pursuant to this section. Initial system must be inspected by a certified inspector or operator at a frequency of at least once every five years and a report submitted. A certified operator is required for the life of the system once repair system is installed.

Signature of Property Owner

Date

NORTH CAROLINA Wake County, I, a Notary Public of the County and State aforesaid, certify that Craig Adams Owner, Personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this 18 day of November 2020.
 My commission expires 11/07/2023 Notary Public Naomi Manley
 WWDS 12/18

submitted electronically by "Nelson Mullins LLP"
 in compliance with North Carolina statutes governing recordable documents
 and the terms of the submitter agreement with the Wake County Register of Deeds.





Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, NC 27587
919-569-6704/fax 919-569-6703

November 24, 2020

Wake County Staff
Wake County Environmental Health Department
336 Fayetteville Street
Raleigh, North Carolina

RE: Flow Reduction Certification and As-built
Alpine Creek Lot 18
1421 Alpine Creek Drive 182, Raleigh, Wake County, North Carolina
Project #2988

Dear Wake County Staff:

Central Carolina Soil Consulting, PLLC (CCSC) employees in conjunction with Bateman Civil Survey Company, reviewed the fixtures specbook from Ferguson showing the fixtures that were installed in the house at Alpine Creek Lot 18. Several of the fixture selections were changed during construction of the house. The original proposed flow reduction had an overall reduction of 45% for a 5-bedroom house with a 20% requested reduction in flow, reducing the flow from 600 gallons per day to 480 gallons per day. The attached flow reduction as-built has been updated to include the fixtures that were installed in the house including fixture specification sheets. The as-built overall flow reduction is 39%, slightly lower than the original proposal.

These fixtures or equivalent flow fixtures are required for the life of the home. Any change in fixtures that results in a change of the flow rates must be approved by an Engineer and Wake County Environmental Health Services.

If you need further information or have any questions please contact Matt Burdette at (919) 422-2827 or Tom Speight at 919-577-1080 2524 Reliance Ave, Apex NC 27539

Sincerely,

Central Carolina Soil Consulting, PLLC

Matt Burdette
Environmental Specialist

Bateman Civil Survey Company
NCBELS# C-2378.

Tom Speight, P.E.
(seal)



Alpine Creek Lot 18 AS BUILT						
	Item		Gal/min. or flush	Number of Fixures	Base Flow From 1982	Percent Water Savings
Laundry Room	Laundry Faucet	Pfister G529	1.8 gal/minute	1	5.5 gal/minute	67%
Basement & Wet Bars	Basement Bar Faucet	Steampunk 8509	1.2 gal/minute	1	3.0 gal/minute	60%
	Wet Bar Faucet	Brizio 63925	1.8 gal/minute	1	5.5 gal/minute	67%
Master	Shower	Rohl 100042 & 1020	1.8 gal/minute	2	5.5 gal/minute	67%
	Lavatory Faucet	Rohl 1419	1.2 gal/minute	2	3.0 gal/minute	60%
	Hand Shower	Brizio 75785	2.0 gal/minute	1	5.5 gal/minute	64%
	Tub Trim	Rohl A1401	Fill & Release	1	Fill & Release	0%
Kitchen/Scullery	Kitchen Sink Faucet	Waterstone 5500	1.75 gal/minute	2	3.0 gal/minute	42%
	Scullery Sink Faucet	Kohler 77515	1.5 gal/minute	1	3.0 gal/minute	50%
	Beverage Filler	Waterstone 1200	Fill & Release	1	Fill & Release	0%
Bath 2	Lavatory Faucet	Mirabelle MIRWSCSM800	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower Head	Mirabelle MIRRSCS825	2.5 gal/minute	1	5.5 gal/minute	55%
Bath 3	Lavatory Faucet	Mirabelle MIRWSCSM800	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower Head	Mirabelle MIRRSCS825	2.5 gal/minute	1	5.5 gal/minute	55%
Playroom Bath	Lavatory Faucet	Mirabelle MIRWSCSM800	1.2 gal/minute	1	3.0 gal/minute	60%
	Hand Shower	American Standard 1660771	1.7 gal/minute	1	5.5 gal/minute	69%
Pool Bath	Lavatory Faucet	Mirabelle MIRWSCSM800	1.2 gal/minute	1	3.0 gal/minute	60%
	Hand Shower	Rohl D63003	1.8 gal/minute	1	5.5 gal/minute	67%
Guest Room	Shower Head	Hansgrohe 04751830	1.8 gal/minute	1	5.5 gal/minute	67%
	Lavatory Faucet	Rohl 1409	1.2 gal/minute	1	3.0 gal/minute	60%
	Hand Shower	American Standard 9035154	2.5 gal/minute	1	5.5 gal/minute	55%
Powder	Lavatory Faucet	Rohl 1405	1.2 gal/minute	1	3.0 gal/minute	60%
Toilets	Master, 2, 3, Play, Pool, Guest	Toto 6114114, Am. Std. 2891, Kohler 4143	1.28 gal /flush	6	3.5 gal/minute	63%

FIXTURES	TOILET	FAUCET	SHOWER	LEAK	BATH	OTHER	DISHWASHER	CLOTHES WASHER	TOTALS
PERCENT OF HOUSE HOLD WATER USE	24%	20%	20%	12%	3%	3%	2%	16%	100%
GALLONS PER DAY (600 BASE)	144	120	120	72	18	18	12	96	600
PERCENT OF SAVINGS FROM WATER SAVING FIXURES	63%	57% avg	64% avg	0%	0%	0%	0%	0%	39%
ADJUSTED FLOW (GALLONS)	53	52	43	72	18	18	12	96	364

Pfister

Pfirst Series™ Pull Down Kitchen Faucet

- G529-PF2B Finish(B) ☐
- G529-PF2C Finish(C) ☐
- G529-PF2S Finish(S) ☐
- G529-PF2Y Finish(Y) ☐



Specifications

Features

- 1.8 GPM Flow Rate
- Optional Deckplate Available, Order 961-250*
- 3 Function Pull-Down Sprayer (Stream, Spray, and Pause)
- Pfister Connect™
- Forward Handle Operation
- Pforever Warranty®

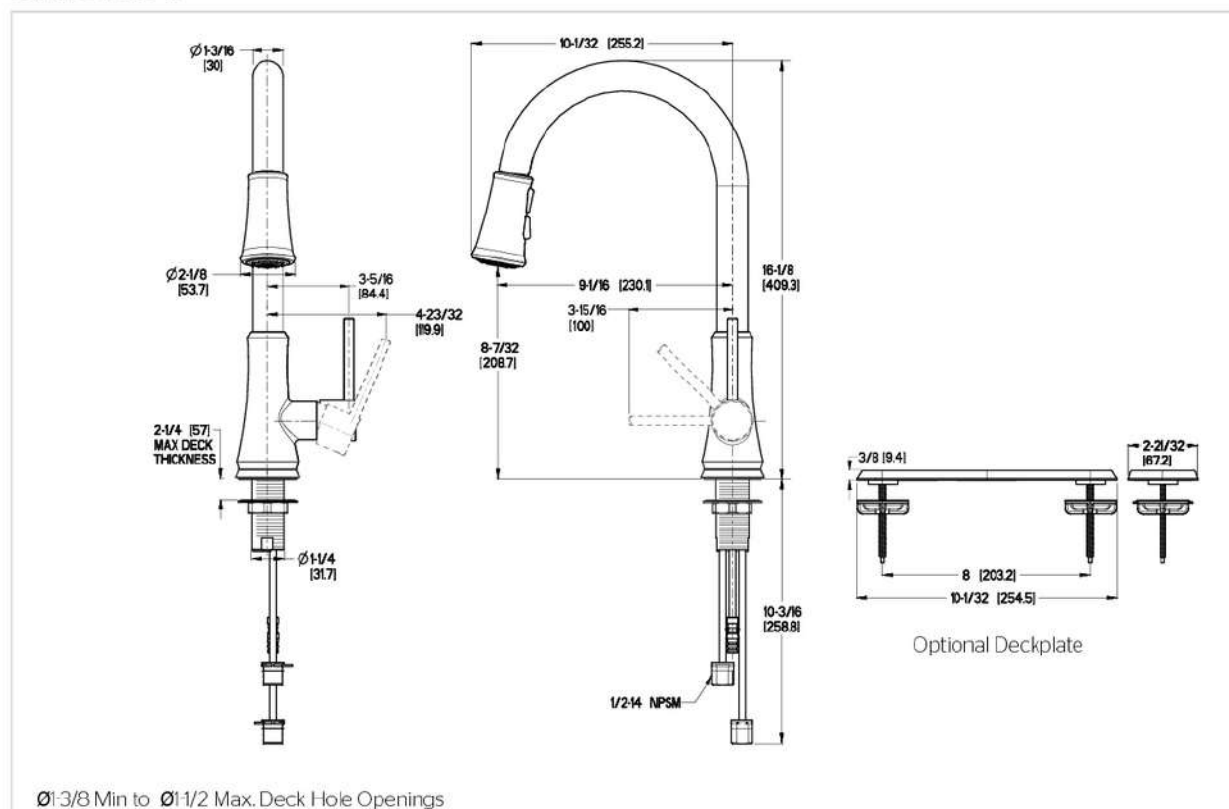
Code Compliance

Pfister products are designed and manufactured in compliance with the following standards and codes:

- IAPMO Certified
- NSF 61/9 Annex G (Low lead)
- Cal Green Compliant
- CEC Certified
- ADA Compliant-ANSI A117.1 (Lever handles only)
- ASME A112.18.3 (Backflow Prevention)



Dimensions



12272-10 REV 01

1-800-PFAUCET (732-8238) • pfisterfaucets.com/support

Copyright © 2019, Pfister Inc.

September 6, 2019

SS-G529-PF2X

Wet Bar

Brizo Single Hole Bar Faucet 63925LF-PN

BRIZO®

KITCHEN FAUCETS

- Artesso® Collection
- Single Handle Deck Mount

FEATURES:

- DIAMOND Seal® Technology
- MagneDock® Magnetic Docking
- Touch-Clean® Sprayhead

STANDARD SPECIFICATIONS:

- Maximum 1.8 gpm @ 60 psi, 6.8 L/min @ 414 kPa
- One hole mount
- Spout rotates 360°
- Diamond coated ceramic cartridge
- Quick connect hoses
- Two-function wand: aerated stream or spray
- Dual integral check valves in sprayer

WARRANTY

- Lifetime limited warranty on parts (other than electronic parts and batteries) and finishes; or, for commercial users, for 5 years from date of purchase.
- 5 year limited warranty on electronic parts (other than batteries); or, for commercial users, for 1 year from the date of purchase. No warranty is provided on batteries.



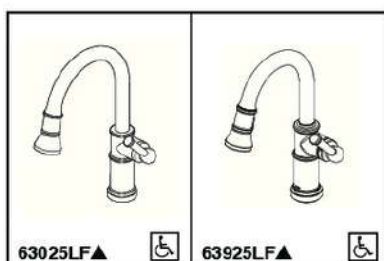
COMPLIES WITH:

- ASME A112.18.1 / CSA B125.1
- ASME A112.18.6
- Indicates compliance to ICC/ANSI A117.1
- Verified compliant with .25% weighted average Pb content regulations.

RP71451▲
Models compatible with optional three-hole escutcheon (not included)

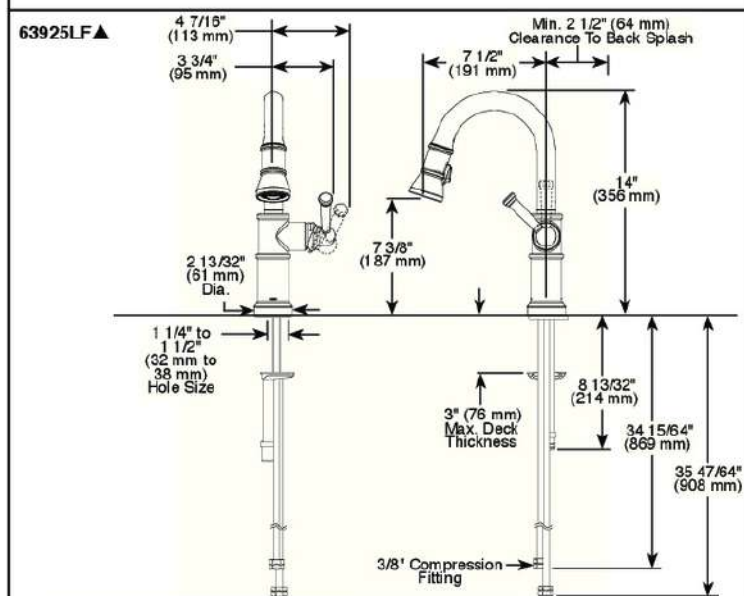
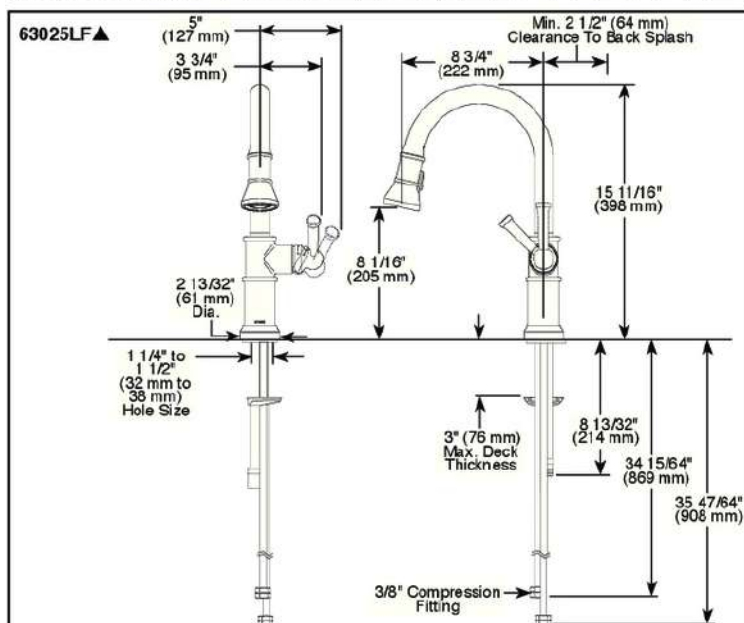


Brizo Kitchen & Bath Company
Indianapolis, Indiana 46280
A Division of Masco Corporation of Indiana
© 2016 Brizo Kitchen & Bath Company



Submitted Model No.: _____

Specific Features: _____



▲ Designate proper finish suffix

Brizo Kitchen & Bath Company reserves the right (1) to make changes in specifications and materials, and (2) to change or discontinue models, both without notice or obligation. Dimensions are for reference only. See current full-line price book or www.brizo.com for finish options and product availability.

BSP-K-63025LF Rev. D

Basement Bar

STEAMPUNK SATIN BRASS BAR FCT SGL SP-C8509W1SB



Steampunk Bay™

SINGLE HOLE LAVATORY FAUCET

Features

- 1/4 turn ceramic disc mixing cartridge (off-cold-warm-hot)
- Flexible braided hoses for ease of installation
- Φ 1-1/4" all brass touch style pop up drain assembly
- 1.2 gpm (4.5 L/min) max flow rate
- All brass construction
- Over 30 finishes including 15 PVD finishes

Codes/Standards Applicable

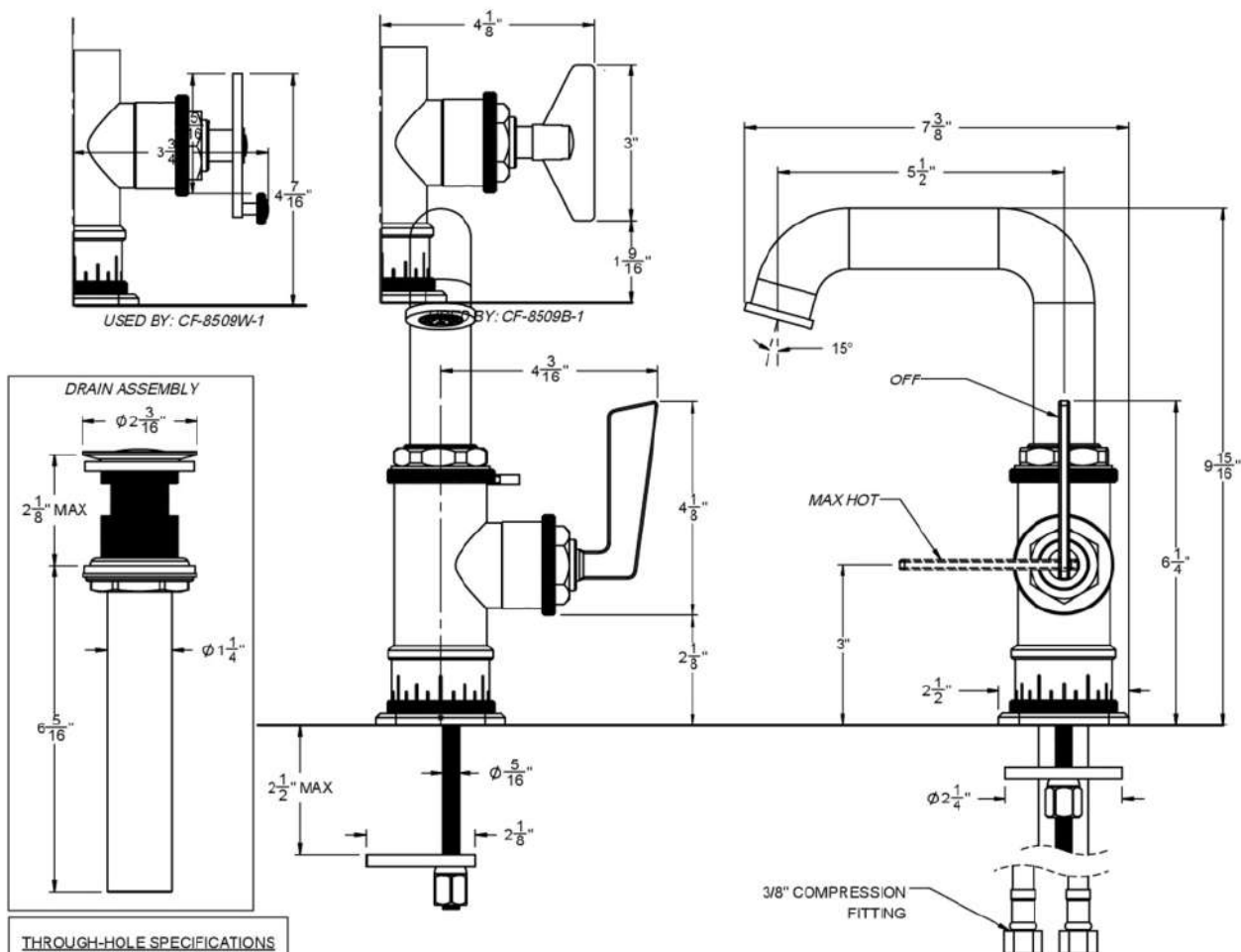
Product meets or exceeds the following:

- ASME A112.18.1/CSA B125.1
- NSF/ANSI 61 & NSF/ANSI 372
- CEC & DOE
- ADA compliant (lever handles only)

CF-8509-1
CF-8509W-1
CF-8509B-1



CF-8509-1 SHOWN



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

ALL DIMENSIONS SHOWN TO NEAREST 1/16"

californiafaucets.com

Page 1

CF-8509-1_sp_190208

Product Details and Dimensions

ROHL

Rohl BI00042PN "Spa" Shower Head



Details and Dimensions

Shower Head Type	Multi Function
Width	2-1/2"
Height	3-7/8"
Connection Size	"1/2"" female inlet w/swivel connection"
Spray Face Diameter	2-1/2"
Construction	Brass
Number Of Spray Head Functions	6
Spray Functions	6 Adjustable spray nozzles that produce everything from a high pressure spray to a soft cascading stream
Shower Arm Included	No
Flow Rate (GPM)	1.75
Adjustable Spray Angle	Yes
Ball Joint	Yes
Flange Included	No
Includes	6- jet Adjustable shower head
Eco-Friendly	Cal Green Compliant
CEC Approved	Yes

Disclaimer -- This is not an actual Manufacturer's Specification Sheet. The details and dimensions listed are accurate to the best of our knowledge at the time this document was produced. For an official specification sheet, please contact the manufacturer directly.



Aqui Deck Mount Bridge Lavatory Faucet

ROHL Country Bath Collection

A1419LM (Metal Levers)

A1419LP (Porcelain Levers)

A1419XM (Cross Handles)

A1419LC (Swarovski® Crystal Levers)

A1419XC (Swarovski® Crystal Cross Handles)

FEATURES

- Column spout style
- Remote pop-up included
- 1/4-turn ceramic valves
- 3 x 1 1/4" cutouts
- 6 1/2" reach swivel spout
- 9 3/16" height
- Shank size is 1 1/32" that REDUCES to 1/2" NPT
- Minimum hole size is 1 1/4"
- Solid brass
- Recommended spread on deck is 8" center-to-center: min. 7", max. 8"
- 1.2 GPM

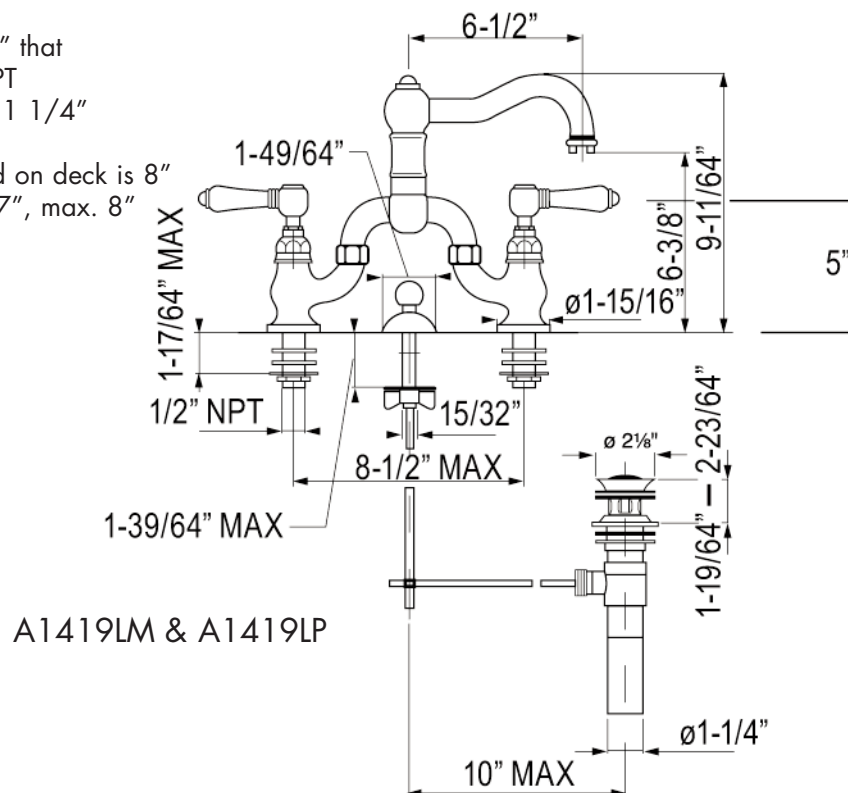
COLORS/FINISHES

- Polished Chrome
- Polished Nickel
- Satin Nickel
- Tuscan Brass
- Italian Brass

WARRANTY

- Limited Lifetime*

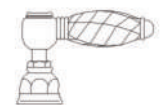
* No Warranty on Tuscan Brass Finish TCB



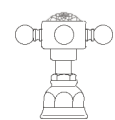
A1419LM & A1419LP



A1419XM



A1419LC



A1419XC





CUSTOM SHOWERING

SHOWERHEAD

Product Codes:

MIRRS820TGCP	8" 1.8 gpm (polished chrome)	MIRRS1020TGCP	10" 1.8 gpm (polished chrome)
MIRRS820TGBN	8" 1.8 gpm (brushed nickel)	MIRRS1020TGBN	10" 1.8 gpm (brushed nickel)
MIRRS820TGPN	8" 1.8 gpm (polished nickel)	MIRRS1020TGPN	10" 1.8 gpm (polished nickel)
MIRRS820TGORB	8" 1.8 gpm (oil rubbed bronze)	MIRRS1020TGORB	10" 1.8 gpm (oil rubbed bronze)
MIRRS825TCP	8" 2.5 gpm (polished chrome)	MIRRS1025TCP	10" 2.5 gpm (polished chrome)
MIRRS825TBN	8" 2.5 gpm (brushed nickel)	MIRRS1025TBN	10" 2.5 gpm (brushed nickel)
MIRRS825TPN	8" 2.5 gpm (polished nickel)	MIRRS1025TPN	10" 2.5 gpm (polished nickel)
MIRRS825TORB	8" 2.5 gpm (oil rubbed bronze)	MIRRS1025TORB	10" 2.5 gpm (oil rubbed bronze)

- Single function showerhead with silicon nozzles
- Brass construction
- 1/2" NPT brass ball joint connection
- Lifetime limited warranty
- cUPC certificated

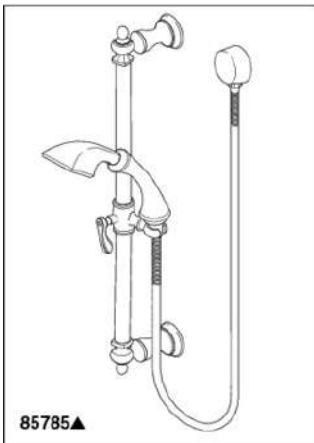


Cap 3/2018

See dimensional drawing on next page
©2018 Ferguson Enterprises, Inc.

Master Bath

CCY 1.75 1F H/SHWR *CHARLO PN DRP70609PN



BRIZO[®] HAND SHOWER W/ SLIDE BAR

- Charlotte™ Bath Collection
- Hand Shower with Full Spray Pattern and Touch Clean Nubs
- Certified Dual Check Valves
- 24" Wall Bar with Adjustable Height and Angle
- 69" (1753 mm) Metal Hose with Matching Finish

STANDARD SPECIFICATIONS:

- Hand shower with full spray pattern and touch clean nubs.
- Certified dual check valves.
- 2.0 gpm @ 80 psi (7.6 L/min @ 552 kPa)
- 24" (610 mm) wall bar with adjustable slide (allows for adjustable shower height). Not to be used as a Grab Bar. Not ADA compliant.
- 69" (1753 mm) flexible metal hose in matching finish.

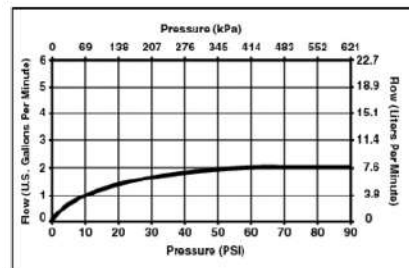
WARRANTY

- Lifetime Faucet and Finish Limited Warranty to the original consumer purchaser to be free from defects in material and workmanship.
- 5 Year Limited Warranty for usage in all industrial, commercial and business applications.



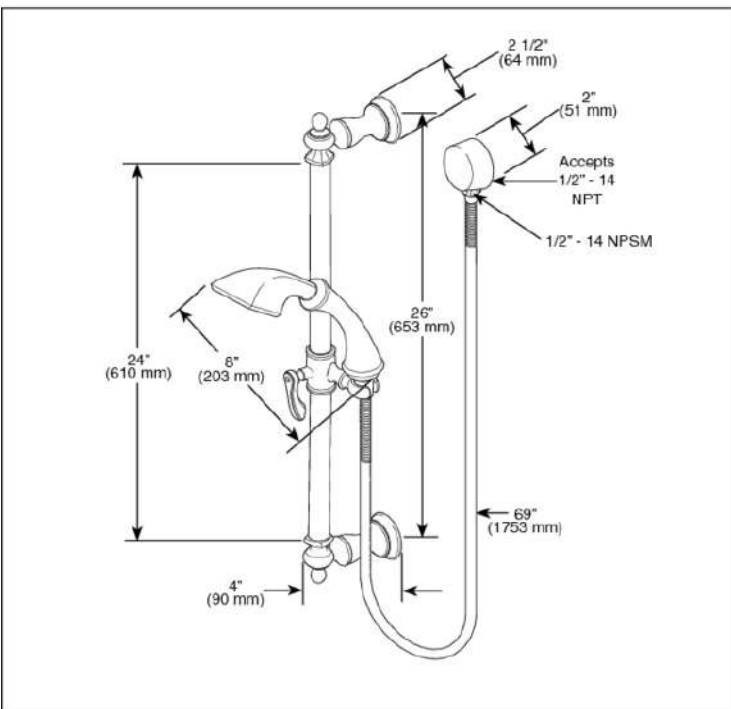
COMPLIES WITH:

- ASME A12.18.1 / CSA B125.1 ♦



Submitted Model No.: _____

Specific Features: _____



▲ Designate proper finish suffix

Spray Pattern



Full Spray

- ◆ Your Brizo Faucet hand shower incorporates a backflow protection system that has been tested to be in compliance with ASME A12.18.3, CSA B125.1 and ASME A12.18.1. It incorporates two certified check valves in series, which operate independently and are integral, non-serviceable parts of the wand assembly.

Delta reserves the right (1) to make changes in specifications and materials, and (2) to change or discontinue models, both without notice or obligation. Dimensions are for reference only. See current full-line price book or www.brizo.com for finish options and product availability.

BSP-B-85785 Rev. A

Delta Faucet Company

55 E. 111th Street, Indianapolis, Indiana 46280
350 South Edgeware Road, St. Thomas, Ontario, Canada N5P 4L1
© 2011 Masco Corporation of Indiana



MADE IN AMERICA
SINCE 1999

TRADITIONAL EXTENDED REACH PLP PULLDOWN FAUCET SPECS

Model # 5500



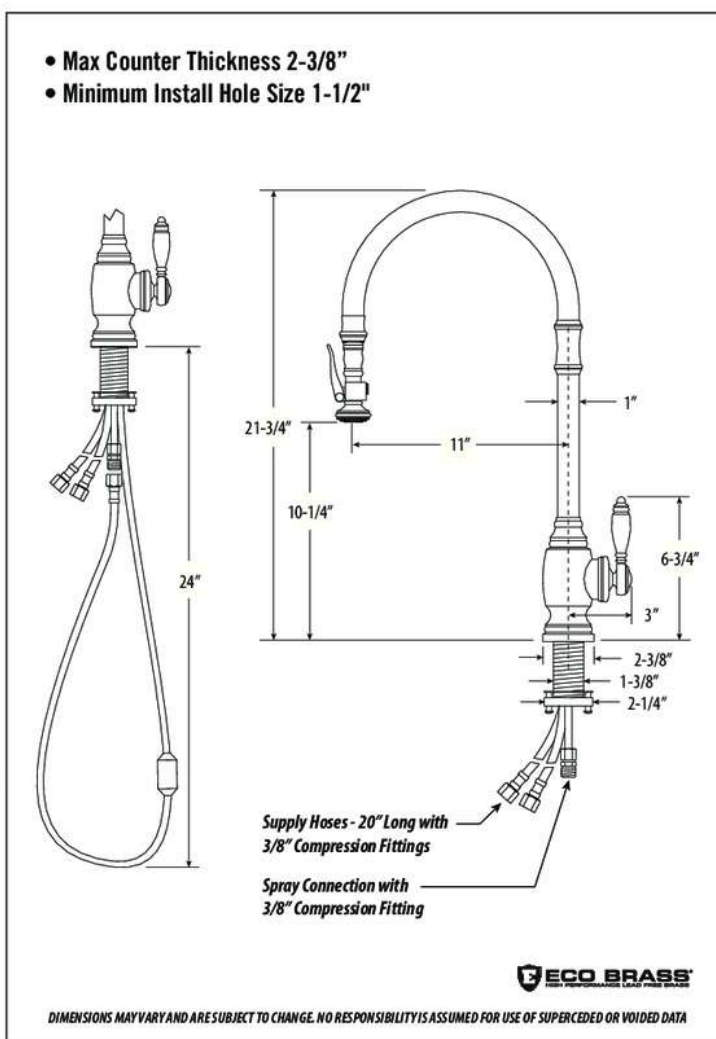
PRODUCT DESCRIPTION

- Unique "PLP" positive lock holds spray head in place.
- Extended reach 11" spout.
- Spray head extends 18" from spout.
- Pre-positioned "Easy Pull" counterbalanced weight.
- Select lever spray or aerated stream.
- Spout swivels 360 degrees.
- Adjustable PTFE "Friction Lock" helps handle feel and prevents sag.
- Handle adjusts 22.5 degrees in either direction for backsplash clearance.
- Single handle mounts in front, right or left hand positions.
- Hot/Cold ceramic disk valve cartridge.
- Compatible with reverse osmosis filtration systems.
- 1.75 gpm maximum flow rate with aerated tip.
- Solid brass construction.
- Includes 3 handle button options. Finish match, ceramic Hot/Cold indicator and ceramic Cold/Hot indicator.
- Reinforced braided connection hoses.
- Lifetime Functional Warranty.
- Made in the USA.

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ASME A112.18.1
- CSA B125.1
- NSF 61, 372
- CALGreen



AVAILABLE IN 30 FINISHES + SOLID STAINLESS STEEL

Antique Brass - AB
Antique Bronze - ABZ
Antique Copper - AC
American Bronze - AMB
Antique Pewter - AP
Gloss Black - GB
Black Nickel - BLN
Black-Oil Rubbed Bronze - ORB
Caribbean Bronze - CB
Chocolate Bronze - CHB
Chrome - CH

Classic Bronze - CLZ
Distressed Antique Brass - DAB
Distressed Antique Copper - DAC
Distressed American Bronze - DAMB
Distressed Antique Pewter - DAP
Matte Black - MB
Polished Brass - PB
Polished Copper - PC
Polished Gold - PG
Polished Nickel - PN
Satin Brass - SB

Satin Chrome - SC
Satin Gold - SG
Satin Nickel - SN
Stainless Steel - SS*
Tuscan Brass - TB
Unlaquered Polished Brass - UPB
Venetian Bronze - VB
Weathered Brass - WB
Weathered Copper - WC

41180 Raintree Court • Murrieta, CA 92562 • 1-888-304-0660 • Fax 951-304-0525 • www.waterstoneco.com

*Contemporary Styles Only

REVISED: 2-22-18



MADE IN AMERICA
SINCE 1984

HAMPTON COLD ONLY FILTRATION FAUCET SPECS

Model # 1200C



PRODUCT DESCRIPTION

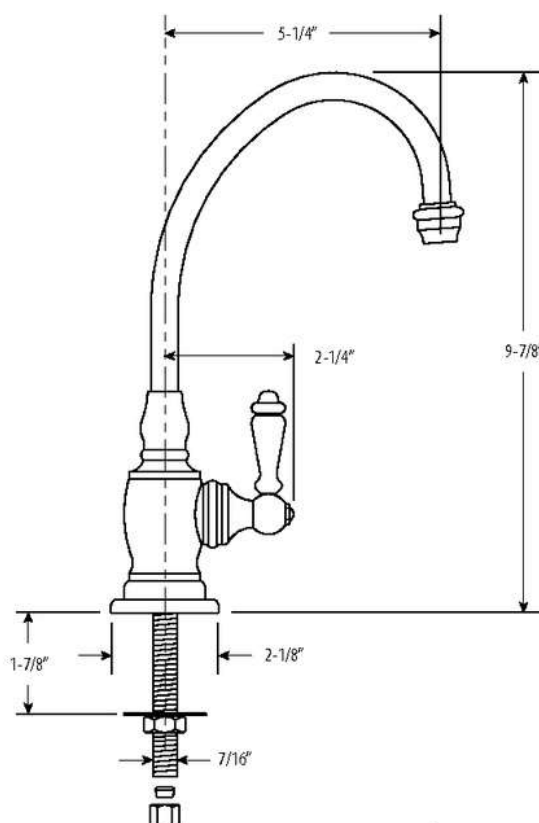
- Cold filtered water on demand.
- For use with Waterstone Filtration System.
- Part of the Hampton Traditional Suite.
- Unique C-spout with 5-1/4" reach.
- Spout swivels 360 degrees.
- Compatible with reverse osmosis filtration systems.
- 1/4 turn ceramic disk valve cartridges.
- 1.1 gpm maximum flow rate.
- 1/4" compression connection.
- Solid brass construction.
- Single lever handle.
- Lifetime Functional Warranty.
- Made in America.

CODES/STANDARDS APPLICABLE

Specified model meets or exceeds the following:

- ASME A112.18.1
- CSA B125.1
- NSF 61, 372
- CALGreen
- ADA Compliant

- Max Counter Thickness 1-7/8"
- Install Hole Size Adaptable Up to 3/4"



ECO BRASS

DIMENSIONS MAY VARY AND ARE SUBJECT TO CHANGE. NO RESPONSIBILITY IS ASSUMED FOR USE OF SUPERCEDED OR VOIDED DATA

AVAILABLE IN 29 FINISHES + SOLID STAINLESS STEEL

Antique Brass - AB
Antique Bronze - ABZ
Antique Copper - AC
American Bronze - AMB
Antique Pewter - AP
Gloss Black - GB
Black Nickel - BLN
Black-Oil Rubbed Bronze - ORB
Caribbean Bronze - CB
Chocolate Bronze - CHB

Chrome - CH
Distressed Antique Brass - DAB
Distressed Antique Copper - DAC
Distressed American Bronze - DAMB
Distressed Antique Pewter - DAP
Matte Black - MB
Polished Brass - PB
Polished Copper - PC
Polished Gold - PG
Polished Nickel - PN

Satin Chrome - SC
Satin Gold - SG
Satin Nickel - SN
Stainless Steel - SS*
Tuscan Brass - TB
Unlaquered Polished Brass - UPB
Venetian Bronze - VB
Weathered Brass - WB
Weathered Copper - WC

41180 Raintree Court • Murrieta, CA 92562 • 1-888-304-0660 • Fax 951-304-0525 • www.waterstoneco.com

**Contemporary Styles Only*

REVISED: 3-1-17

KOHLER. Faucets

Tournant™ Semi-Professional Kitchen Sink Faucet K-77515

Features

- Semi-Professional style faucet with an easy to clean coated hose and removable coil.
- Unique three-function sprayhead allows you to tackle tasks such as cleaning, rinsing and filling with Sweep® Spray, BerrySoft® spray, and aerated stream.
- Sweep® spray creates a wide, forceful blade of water for superior cleaning.
- BerrySoft® is a light spray that gently washes fruits and vegetables.
- DockNetik®, a magnetic docking system that securely locks the sprayhead into place.
- Ceramic disc valves exceed industry longevity standards, ensuring durable performance for life.
- MasterClean™ sprayface features an easy-to-clean surface that withstands mineral buildup.
- High-arch gooseneck swing spout and 360-degree spout rotation offer superior clearance for filling pots and cleaning.
- Single lever handle is simple to use and makes adjusting water temperature easy.
- Temperature memory allows faucet to be turned on and off at the temperature set during prior usage.
- 1.5 gal/min (5.7 l/min) maximum flow rate [max at 60 psi (4.14 bar)]

Material

- Premium metal construction.
- KOHLER finishes resist corrosion and tarnishing.

Installation

- For single-hole installation. (3-hole escutcheon available, sold separately model number K-99272.)
- Flexible supply lines simplify installation.

Recommended Products/Accessories

K-99272 Three-Hole Kitchen Faucet Escutcheon
K-77685 Single-Cartridge Water Filtration System
K-77686 Double-Cartridge Water Filtration System
K-77687 single replacement filter cartridge
K-77688 Replacement Filter Cartridges, Two-Pack



ADA CSA B651

Codes/Standards

ASME A112.18.1/CSA B125.1
NSF/ANSI 61
NSF/ANSI 372
All applicable US Federal and State material regulations
DOE - Energy Policy Act 1992
California Energy Commission (CEC)
ADA
ICC/ANSI A117.1
CSA B651

KOHLER® Faucet Lifetime Limited Warranty

See website for detailed warranty information.

Available Colors/Finishes

Color	Code	Description
	CP	Polished Chrome
	SN	Vibrant® Polished Nickel
	VS	Vibrant® Stainless
	2BZ	Oil-Rubbed Bronze

1-800-4KOHLER (1-800-456-4537)

Kohler Co. reserves the right to make revisions without notice to product specifications.

For the most current Specification Sheet, go to www.kohler.com.

2-16-2019 19:04 - US/CA

THE BOLD LOOK
OF **KOHLER**®



www.rohlhome.com



ACQUI COLUMN SPOUT WIDESPREAD LAVATORY FAUCET

ROHL Country Bath Collection

- A1409LM** (Metal Levers)
- A1409LP** (Porcelain Levers)
- A1409XM** (Cross Handles)
- A1409LC** (Swarovski® Crystal Levers)
- A1409XC** (Swarovski® Crystal Cross Handles)

FEATURES

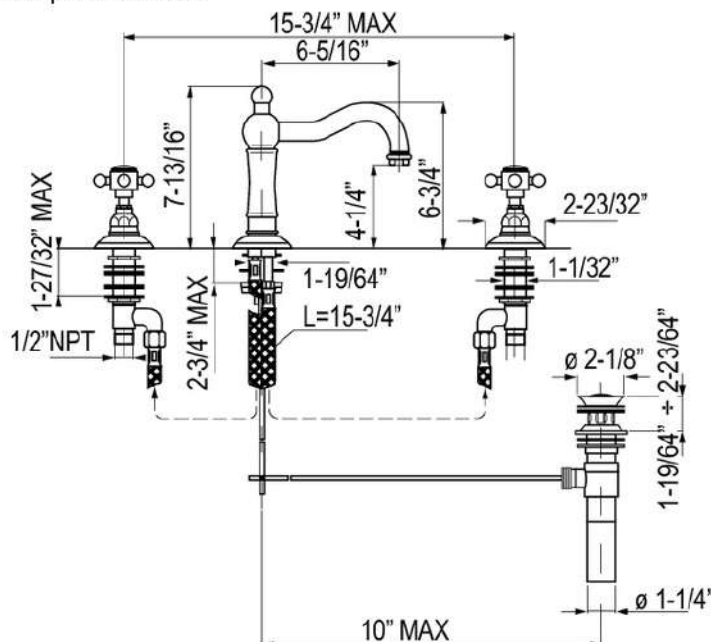
- 1/4-turn ceramic valves
- Solid brass
- 3 x 1 3/8" cutouts
- 6 5/16" spout reach
- 1/2" NPT connectors
- Matching tub filler A1404X and A1414
- Fixed spout
- 15 3/4" maximum spread distance between valves
- 1.2 GPM

COLORS/FINISHES

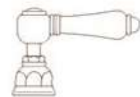
- Polished Chrome
- Polished Nickel
- Satin Nickel
- Tuscan Brass
- Inca Brass

WARRANTY

- Limited Lifetime*
- * No Warranty on Tuscan Brass Finish TCB



A1409XM



A1409LM &
A1409LP



A1409LC



A1409XC

Consult your local ROHL showroom for additional information and specifications. For complete warranty details and a list of showrooms, go to www.rohlhome.com.

Product Details and Dimensions



Hansgrohe 04751830
"Croma"
Shower Head



Details and Dimensions	
Shower Head Type	Multi Function
Number of Spray Nozzles	75
Number Of Spray Head Functions	3
Spray Functions	Full, Pulsating Massage, Intense Turbo
Shower Arm Included	No
Flow Rate (GPM)	1.8
Eco-Friendly	Water Sense

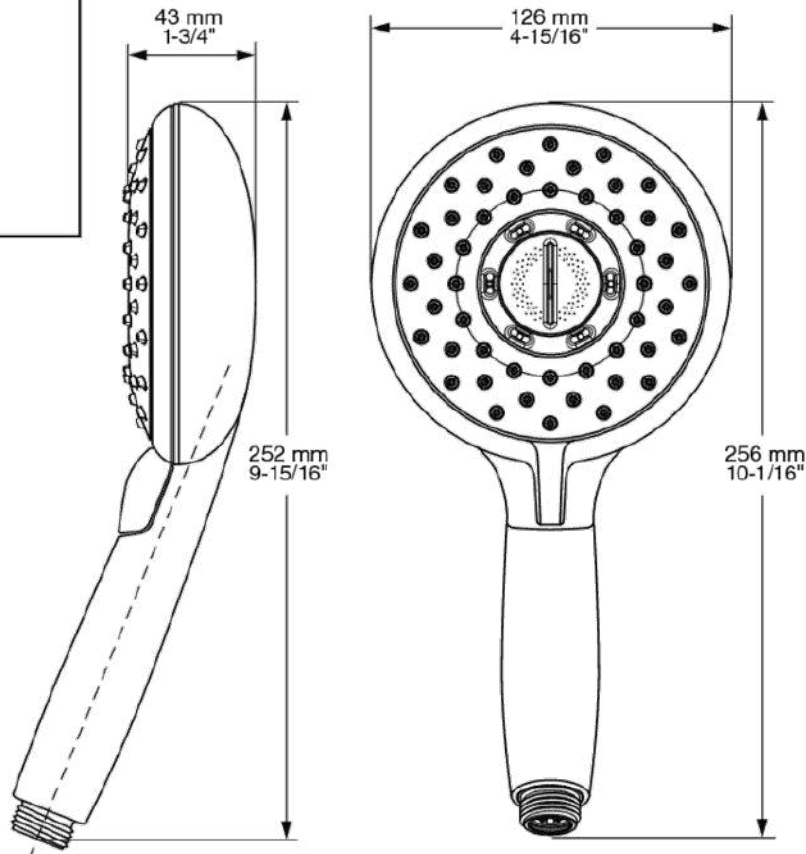
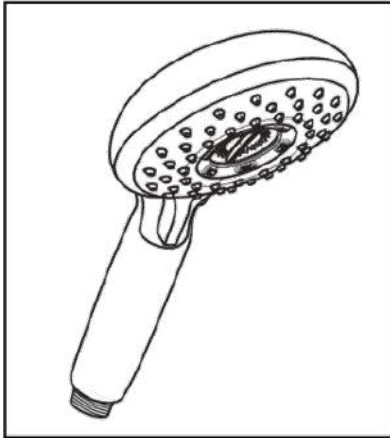
Disclaimer -- This is not an actual Manufacturer's Specification Sheet. The details and dimensions listed are accurate to the best of our knowledge at the time this document was produced. For an official specification sheet, please contact the manufacturer directly.



SPECTRA+ HANDHELD™ 4-FUNCTION HAND SHOWER

MODEL NUMBER:

□ 9035.154 Spectra+™ 4-Function Hand Shower



GENERAL DESCRIPTION:

5" (127 mm) Hand shower adjusts from Drench to Sensitive to Powerwash® to Massage. Permanent built-in compensating flow control device. 2.5 gpm/9.5 L/min. maximum flow rate.

PRODUCT FEATURES:

Pressure Compensating Flow Control Device:

Provides consistent flow over a wide pressure range.

Variety of Spray Functions: Allows the user to select the spray functions best suited to their needs.

SUGGESTED SPECIFICATION

Hand shower shall have 4 spray functions. Hand shower shall have a pressure compensating flow control device. Hand shower shall include check valve to prevent cross flow of hot and cold water. Fitting shall be American Standard Model # 9035.154.____.

Signature Hardware 8" Widespread Bathroom Sink Faucet MIRWSCSM800PN

Mirabelle®

ST.MARTIN COLLECTION

TWO HANDLE WIDESPREAD FAUCET

Product Codes:

MIRWSCSM800CP (polished chrome)
MIRWSCSM800BN (brushed nickel)
MIRWSCSM800ORB (oil rubbed bronze)
MIRWSCSM800PN (polished nickel)

- Brass construction
- Max. flow rate: 1.2 gpm (4.5 L/min) at 60 psi
- Requires 3-hole sink with 8" on-center
- Ceramic disc cartridges
- With brass pop up
- NSF/ANSI Std. 61-9 compliant
- cUPC/IAPMO listed
- ADA compliant
- WaterSense approved
- Compliant with lead content requirements of California AB 1953



See dimensional drawing on next page

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ST.MARTIN

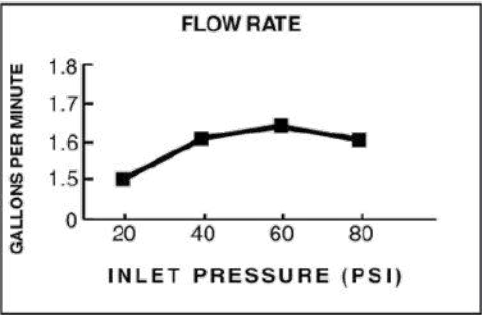


SPECTRA+ HANDHELD™ KIT
4-FUNCTION HAND SHOWER KIT

CODES AND STANDARDS

These products meet or exceed the following codes and standards:

ASME A112.18.1
CSA B125.1



Product Number	Description	Finish			
		Brushed Nickel	Polished Nickel	Legacy Bronze	Polished Chrome
		295	013	278	002
1660.771	Spectra+ Handheld™ Kit. Contains Spectra+™ hand shower, and shower arm bracket.				

PART OF LIXIL

Bed 2&3 Bath

Signature Hardware 8" Widespread Bathroom Sink Faucet MIRWSCSM800PN

Mirabelle®

ST.MARTIN COLLECTION

TWO HANDLE WIDESPREAD FAUCET

Product Codes:

MIRWSCSM800CP (polished chrome)
MIRWSCSM800BN (brushed nickel)
MIRWSCSM800ORB (oil rubbed bronze)
MIRWSCSM800PN (polished nickel)

- Brass construction
- Max. flow rate: 1.2 gpm (4.5 L/min) at 60 psi
- Requires 3-hole sink with 8" on-center
- Ceramic disc cartridges
- With brass pop up
- NSF/ANSI Std. 61-9 compliant
- cUPC/IAPMO listed
- ADA compliant
- WaterSense approved
- Compliant with lead content requirements of California AB 1953



See dimensional drawing on next page

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ST.MARTIN

Bed 2&3 Bath

Signature Hardware Shower Head MIRRS825TPN



CUSTOM SHOWERING

SHOWERHEAD

Product Codes:

MIRRS820TGCP	8" 1.8 gpm (polished chrome)	MIRRS1020TGCP	10" 1.8 gpm (polished chrome)
MIRRS820TGBN	8" 1.8 gpm (brushed nickel)	MIRRS1020TGBN	10" 1.8 gpm (brushed nickel)
MIRRS820TGPN	8" 1.8 gpm (polished nickel)	MIRRS1020TGPN	10" 1.8 gpm (polished nickel)
MIRRS820TGORB	8" 1.8 gpm (oil rubbed bronze)	MIRRS1020TGORB	10" 1.8 gpm (oil rubbed bronze)
MIRRS825TCP	8" 2.5 gpm (polished chrome)	MIRRS1025TCP	10" 2.5 gpm (polished chrome)
MIRRS825TBN	8" 2.5 gpm (brushed nickel)	MIRRS1025TBN	10" 2.5 gpm (brushed nickel)
MIRRS825TPN	8" 2.5 gpm (polished nickel)	MIRRS1025TPN	10" 2.5 gpm (polished nickel)
MIRRS825TORB	8" 2.5 gpm (oil rubbed bronze)	MIRRS1025TORB	10" 2.5 gpm (oil rubbed bronze)

- Single function showerhead with silicon nozzles
- Brass construction
- 1/2" NPT brass ball joint connection
- Lifetime limited warranty
- cUPC certificated



Cap 3/2018

See dimensional drawing on next page
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Vocca Wall Mount Bridge Lavatory Faucet

ROHL Italian Country Bath Collection

A1405/44LM-2 (Metal Levers)

A1405/44LP-2 (Porcelain Levers)

A1405/44XM-2 (Cross Handles)

A1405/44LC-2 (Swarovski® Crystal Levers)

A1405/44XC-2 (Swarovski® Crystal Cross Handles)

FEATURES

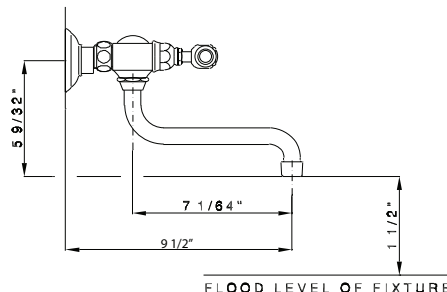
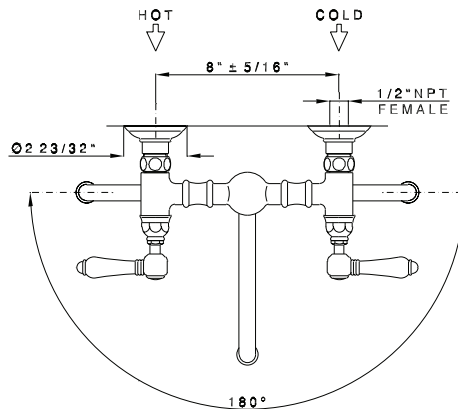
- 8" center-to-center +/- 5/16"
- 1/4-turn ceramic valves
- 9 1/2" spout reach
- Swivel spout
- 2 x 3/4" cutouts
- 2 5/8" escutcheon diameter
- Drain assembly not included, order CNZREMOTE
- Solid brass
- 1.2 GPM

COLORS/FINISHES

- Polished Chrome
- Polished Nickel
- Satin Nickel
- Tuscan Brass
- Inca Brass

WARRANTY

- Limited Lifetime*
- * No Warranty on Tuscan Brass Finish (TCB)



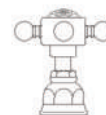
A1405/44LM &
A1405/44LP



A1405/44XM



A1405/44LC



A1405/44XC



Three-Function Rain-Flow Handshower Set

ROHL Shower

D63003

FEATURES

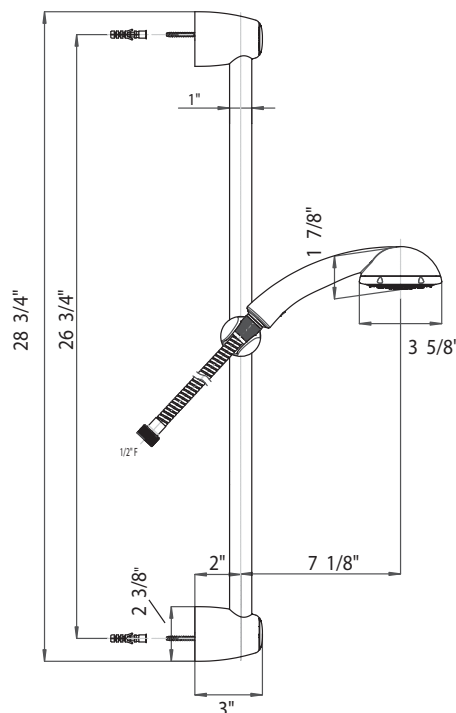
- Complete with the following items:— D63000: Shower bar
- B00151: Handshower
- A40/1: Flexible 59" metal hose
- 1.8 GPM
- Wall outlet for hose and handshower required, order E824

COLORS/FINISHES

- Polished Chrome
- Polished Nickel
- Satin Nickel
- Tuscan Brass

WARRANTY

- 2 years on manufacturer defects*
- * No warranty on Tuscan Brass Finish (TCB)





Wall Mount Bridge Lavatory Faucet

ROHL Country Bath Collection

A1423LM* (Metal Levers)

A1423LP* (Porcelain Levers)

A1423XM* (Cross Handles)

A1423LC* (Swarovski® Crystal Levers)

A1423XC* (Swarovski® Crystal Cross Handles)

FEATURES

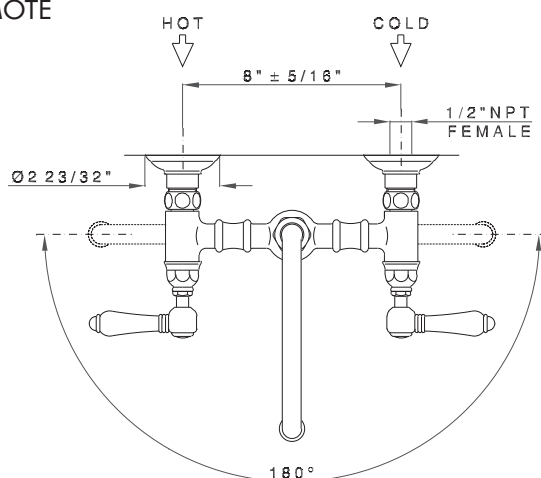
- 8" center-to-center +/- 5/16"
- 1/4-turn ceramic valves
- 9 1/4" spout reach
- Swivel spout
- 2 5/8" escutcheon diameter
- Drain assembly not included with faucet, order with CNZREMOTE
- 2 x 3/4" cutouts
- Solid brass
- 1.5 GPM

COLORS/FINISHES

- Polished Chrome
- Polished Nickel
- Satin Nickel
- Tuscan Brass
- Inca Brass

WARRANTY

- Limited Lifetime*
- * No Warranty on Tuscan Brass Finish (TCB)



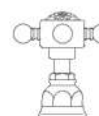
A1423LM & A1423LP



A1423XM



A1423LC



A1423XC

* For CA/V T, place a "-2" at end of model number for code compliant product. (Example A3608LMAPC-2)

Consult your local ROHL showroom for additional information and specifications. For complete warranty details and a list of showrooms, go to www.rohlhome.com.

TOTO®

MS614114CEF(R)(G)

Carlyle® II One-Piece High-Efficiency Toilet, 1.28GPF

FEATURES

- Tornado Flush™ flushing system, low consumption (1.28GPF/4.8LPF)
- Skirted design
- CeFiONtect™ ceramic glaze - prevents debris and mold from sticking to ceramic surfaces, leading to fewer chemicals and less water in cleaning (not avail on Ebony #51)
- Universal Height
- Decorative one-piece design with high-profile tank
- Elongated front bowl with SoftClose® seat (SS114)
- 12" Unifit rough-in
- Chrome trip lever

MODELS

- MS614114CEFG
With CeFiONtect ceramic glaze, SS114 SoftClose seat included
- MS614114CEFRG
Same as above, with right-hand trip lever
- MS614114CEF
Less CeFiONtect, SS114 SoftClose seat included (#51 only)

COLORS/FINISHES

- #01 Cotton
- #03 Bone
- #11 Colonial White
- #12 Sedona Beige
- #51 Ebony (not available in CeFiONtect)

OPTIONAL ROUGH-IN

- 10" rough-in TSU01W.10R
- 14" rough-in TSU01W.14R

PRODUCT SPECIFICATION

The one-piece high-efficiency Tornado Flush flushing system toilet shall be 1.28GPF/4.8LPF. Toilet shall have optional CeFiONtect ceramic glaze and be at Universal Height. Toilet shall have high-profile tank, elongated front bowl with SoftClose seat and Chrome trip lever. Toilet shall be TOTO Model MS614114CEF_____.



 **Tornado Flush**

 **CeFiONtect**

CODES/STANDARDS

- Meets or exceeds ASME A112.19.2/CSA B45.1
- Certifications: IAPMO(cUPC), EPA Watersense, State of Massachusetts, City of Los Angeles, and others
- Code compliance: UPC, IPC, NSPC, NPC Canada, and others
- Legislative Compliance: California AB715, California Green Building Code, City of Los Angeles Water Efficiency Ordinance
- ADA compliant (when installed with trip lever located on the approach side)





BOULEVARD FloWise™ RIGHT HEIGHT™ ELONGATED ONE-PIECE TOILET

VITREOUS CHINA

BOULEVARD FloWise™ RIGHT HEIGHT™ ELONGATED ONE-PIECE TOILET

2891.128

- Vitreous china
- **LXP (Luxury Performance) Toilet**
- Meets definition for HET (High Efficiency Toilet)
1.28 gpf/4.8 Lpf
- Meets EPA WaterSenseSM criteria
- Contributes to a LEED solution
- Elongated siphon action bowl with smooth-sided, concealed trapway
- PowerWash™ rim scrubs bowl with each flush
- 16-1/2" rim height for accessible applications
- Fully glazed 2" trapway
- Oversized 3" flush valve with chemically resistant flapper
- Chrome trip lever
- 2 color-matched bolt hole covers
- Includes color-matched Duroplast Slow Close Toilet Seat and cover with concealed seat ring and easy lift-off feature for simple removal and reattachment for cleaning
- 100% factory flush tested
- **Design coordinates with Studio and Boulevard lavatories**
- 10 year warranty on entire toilet



Nominal Dimensions:

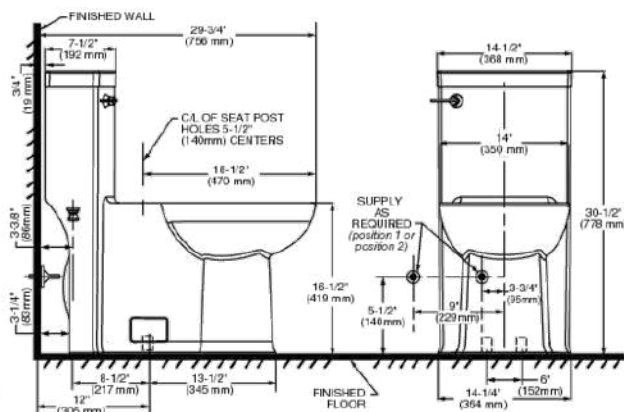
756 x 368 x 778mm
(29-3/4" x 14-1/2" x 30-1/2")

Fixture only, supply by others

Compliance Certifications -

Meets or Exceeds the Following Specifications:

- ASME A112.19.2-2008 / CSA B45.1-08
- US EPA WaterSenseSM Specification for HET's



IMPORTANT: Water supply on the wall is required at 2-3/4" or 5" from centerline of the toilet (see rough-in). First suggested position is hidden behind the toilet. The geometry of the toilet gives space for this installation. The second suggested position is next to the toilet. Between these two positions, the space for the supply between wall and toilet is limited to 3-1/4". In this case, check your supply and hose dimensions.

To Be Specified:

- ☐ Color:
 - ☐ White
 - ☐ Bone
 - ☐ Linen
- ☐ Supply with Stop:

NOTES:

THIS TOILET IS DESIGNED TO ROUGH-IN AT A MINIMUM DIMENSION OF 305MM (12") FROM FINISHED WALL TO C/L OF OUTLET. SUPPLY NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
* DIMENSION SHOWN FOR LOCATION OF SUPPLY IS SUGGESTED.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerance established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.



MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES-CHECK LOCAL CODES.



Playroom, Pool, Bed 2&3 Baths

Kohler Toilet Tank Part K4143-0

KOHLER®

Corbelle™
Toilet Tank
K-4143

Features

- Vitreous China.
- AquaPiston® Flushing system.
- Includes left-hand polished chrome trip lever.
- 1.28 gpf (4.8 lpf).
- Less supply line.
- Combines with the K-4144 Bowl to create a complete K-3814 Corbelle™ toilet

Components

Additional included component/s: Tank Cover, Trip Lever, and Hardware kit.



Codes/Standards

ASME A112.19.2/CSA B45.1

See website for detailed warranty information.

Available Color/Finishes

Color	Code	Description
-------	------	-------------



0

White

USA/Canada: 1-800-4KOHLER (1-800-456-4537)

Kohler Co. reserves the right to make revisions without notice to product specifications.

For the most current Specification Sheet, go to www.kohler.com.

8-18-2017 03:00

THE BOLD LOOK
OF **KOHLER®**



TEL 919 856 7400
FAX 919 856 7407

Environmental Services

Water Quality Division
336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602

11/26/2019

REQUIREMENTS TO COMPLETE YOUR ENGINEERED FLOW REDUCTION SYSTEM

NAME: Tall Tradition Building
ADDRESS: 8916 Lindenshire Rd., Raleigh, NC 27615
Re: Application for Engineered Flow Reduction System
SEPTIC PERMIT: WRP-026251-2019
PIN: 1719 87 3863
Building Permit: RBPR-026213-2019
Property Description: ALPINE CREEK ESTATES, Lot 18, 2.11 Ac.

Dear Sir/Madam:

Enclosed is your approved Engineer Flow Reduction plan as permitted under Session Law 2014-120 Section 53, and the "Engineer Flow Reduction Sewage Disposal System Maintenance Information Sheet".
"Neither the State nor local health department shall be liable for any damages caused by an engineered system approved or permitted pursuant to Session Law 2014-120 Section 53."

To complete your permit:

- **System Installation** - A contractor **CERTIFIED** by the State of North Carolina and **REGISTERED** in Wake County, must be used to install your system, if applicable.
- **System Components** - All portions of the engineered design plans shall be completed using only materials specified in the engineered design plans.
- **Engineer Certification** - The engineer must certify that the design plans have been completed to the specifications in the approved design, and provide an engineer certification letter to Wake County that is SEALED, SIGNED, AND DATED stating as much.
- **Alternative Sewage Disposal System Maintenance Schedule** - this document must be signed, notarized and recorded at the Wake County Register of Deeds Office. A copy of the recorded document must be submitted to Wake County before your permit can be finalized.

A copy of the "Wake County Well and Septic System Owner's Guide", which contain information essential to the long-term performance of this wastewater disposal system, must be forwarded to the owner or user of the system, if other than yourself.

ANY PROPOSED MODIFICATION TO THE APPROVED PLANS MUST BE COORDINATED WITH YOUR DESIGN ENGINEER.

Please call (919) 856-7439 or email at Ishwar.Devkota@wakegov.com if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Ishwar Devkota".

Ishwar Devkota, P.E., REHS
Environmental Consultant

WAKE COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER PERMIT

NO PERMIT(S) FOR CONSTRUCTION, LOCATION OR RELOCATION ACTIVITY SHALL BE ISSUED UNTIL AN AUTHORIZATION FOR WASTEWATER SYSTEM CONSTRUCTION AUTHORIZATION HAS BEEN ISSUED

PERMIT VOID IF NOT IN COMPLIANCE WITH ZONING REGULATIONS AND/OR IF SITE IS ALTERED OR INTENDED USE CHANGED

CONSTRUCTION AUTHORIZATION PERMIT

PERMIT # WRP-026251-2019 **APPLICATION DATE:** 09/30/2019 **BLDG. PERMIT#:** RBPR-026213-2019

PIN: 1719873863 **RECORDED:** Yes

TOWNSHIP: 02 - Bartons Creek **JURISDICTION:** Wake County **ZONING:** R-80W

APPLICANT: Tall Tradition Building
8916 Lindenshire RD
RALEIGH NC, NC 27615

BUSINESS PHONE: (919) 427-6284
HOME PHONE:
MOBILE PHONE: (919) 427-6284

HD USE: 101A CONVENTIONAL ONE-FAMILY HOUSE **EXISTING USE:**

SITE ADDRESS: 1421 ALPINE CREEK DR

SUBDIVISION: ALPINE CREEK ESTATES **LOT:** 18 **ACRES:** 2.11

DIRECTIONS: Falls of Neuse north to left on Raven ridge 2 miles turn right on Hardie Rd. 1/4 mile turn right on Alpine Creek Drive. Entry code is #7420. Lot 18 is at end of road in cul de sac.

Contractors shall install system on contour. See attached SITE PLAN for wastewater system design and well location. No underground utilities, water lines or sprinklers systems may be located in the original system, or permit areas. A septic tank filter with two risers for access is required. The wastewater system shall not be covered or placed into use until inspected by the Wake County Department of Environmental Services and Operations Permit issued. An Accepted Status System may be used in place of conventional system, if it can be placed in the permitted/authorized trench footprint (except reduction in line length and/or number as allowed for in approval) and the installation in accordance with the accepted system approval, without unauthorized product alteration. If permit required use of an Accepted Status System, substitution with another accepted status system may be made, as long as no changes are necessary in the location of each nitrifications line (including any increase in line length), trench depth or effluent distribution method. If changes are necessary, prior approval by this office is required before system installation. Maximum depth of line is calculated using the downhill side of the trench and includes slope correction.

CONSTRUCTION AUTHORIZATION PERMIT VALID FOR: Five Years

CONSTRUCTION AUTHORIZATION PERMIT: CA STATUS: Issued **BY:** Ishwar Devkota **DATE:** 11/26/2019

CA VALID FOR: Five Years **DESIGN FLOW:** 480 GALLONS **BASEMENT:** Yes **BASEMENT FIXTURES:** Yes

SEPTIC TANK: 1500 GALLONS **SEPTIC TANK FILTER:** Yes
DOSING PUMP TANK: 1500 GALLONS **DOSING PUMP TANK FILTER:**
GREASE TRAP: **GREASE TRAP FILTER:**
RECIRCULATION PUMP TANK: **RECIRCULATION PUMP TANK FILTER:**

PROPOSED SYSTEM: 0.25 - 25% Reduction (Innovative or Accepted) **EXISTING SYSTEM:**
DRAINFIELD SQ. FT: 1,275 **AGGREGATE DEPTH:** 12 **MAX. TRENCH DEPTH:** 18 INCHES
DISTRIBUTION DEVICE: PM - Pressure Manifold

TRENCH #: 7 **TRENCH LENGTH:** 70,65,60,55,50,50,75 FEET **TRENCH WIDTH:** 36 INCHES **TOTAL TRENCH LENGTH:** 425 FEET

CENTER SPACING:
PRETREATMENT:
SUBFIELDS #:
PUMP TDH: 24.22 FEET

MINIMUM SOIL COVER:
APPROVAL #:
PUMP DESIGN FLOW: 43.25
ZONE VALVE:

ASDMS REQUIRED: Yes
P.E. SIGN OFF/ASBUILT REQUIRED: No

LINE OF CREDIT REQUIRED:
TRIPARTY AGREEMENT REQUIRED:

OPERATOR REQUIRED: No

SPECIFIC CONSTRUCTION AUTHORIZATION REQUIREMENTS:

THIS PERMIT IS FOR FIVE (5) BEDROOM DWELLING WITH 480 GALLONS DAILY FLOW USING ENGINEERED FLOW REDUCTION. INITIAL SYSTEM IS AN UNEQUAL LINE LENGTH PRESSURE MANIFOLD SYSTEM PUMP TO 7 DRAINLINES WITH 18" TRENCH BOTTOM. REPAIR SYSTEM IS AN UNEQUAL LINE LENGTH DRIP WITH 12" TRENCH BOTTOM. 1500 GALLON SEPTIC TANK AND 1500 GALLON PUMP TANK REQUIRED. WHEN INSTALLING SYSTEM, PLEASE MAINTAIN ALL REQUIRED SETBACKS. DO NOT DISTURB OR REMOVE ANY SOIL IN INITIAL OR REPAIR AREAS. MUST MAINTAIN REQUIRED EMERGENCY STORAGE IN PUMP TANK. A NEMA 4X CONTROL PANEL WITH TWO BREAKERS, TWO POWER SUPPLIES, ELAPSED TIME METER AND CYCLE COUNTER IS REQUIRED. IF FLAGS ARE MISSING, CALL DESIGNER TO RE-FLAG. THIS SYSTEM IS DESIGNED BY A CONSULTANT AND MUST BE INSTALLED PER THE DESIGN, INCLUDING THE USE OF THE MATERIALS SPECIFIED IN THE DESIGN. ANY DEVIATION MUST BE APPROVED BY THE DESIGNER OR WAKE COUNTY ENVIRONMENTAL SERVICES PRIOR TO SYSTEM INSTALLATION.

NEITHER THE STATE NOR LOCAL HEALTH DEPARTMENT SHALL BE LIABLE FOR ANY DAMAGES CAUSED BY AN ENGINEERED SYSTEM APPROVED OR PERMITTED PURSUANT TO SESSION LAW 2014-120 SECTION 53. ALTERNATIVE SEWAGE DISPOSAL SYSTEM MAINTENANCE SCHEDULE MUST BE SIGNED, NOTARIZED AND RECORDED AT THE WAKE COUNTY REGISTER OF DEEDS OFFICE. ENGINEER CERTIFICATION OF REQUIRED FIXTURE INSTALLATION ARE REQUIRED PRIOR TO ISSUANCE OF 5 BEDROOM OPERATION PERMIT. PLEASE CONTACT ENVIRONMENTAL SERVICES IF ANY QUESTIONS OR PROBLEMS ARISE PRIOR TO INSTALLATION.

DUE TO PRETREATMENT DEVICE REQUIREMENT FOR THE REPAIR SYSTEM, WAKE COUNTY REGULATIONS (SECTION IV, E) REQUIRE THAT THE INITIAL SYSTEM BE INSPECTED AT LEAST ONCE EVERY 5 YEARS BY A CERTIFIED OPERATOR AND THE ALTERNATIVE SEWAGE DISPOSAL SYSTEM MAINTENANCE SCHEDULE MUST BE SIGNED, NOTARIZED AND RECORDED AT THE WAKE COUNTY REGISTER OF DEEDS OFFICE PRIOR TO ISSUANCE OF THE OPERATION PERMIT. ONCE REPAIR SYSTEM IS INSTALLED, THE REQUIREMENTS FOR OPERATION, MAINTENANCE, AND SAMPLING WILL BE IN EFFECT PER REPAIR SYSTEM OPERATION REQUIREMENT. PLEASE CALL ENVIRONMENTAL SERVICES IF ANY QUESTIONS OR PROBLEMS ARISE.

Issued By:

Shawna Denton

Date: 11/26/2019

****CA - PART A - E****

HOMEOWNER GUIDE FOR UTILIZATION AND MAINTENANCE OF ON-SITE WASTEWATER DISPOSAL SYSTEMS

What is an On-site Wastewater Disposal System?

There are a number of different types of on-site wastewater disposal systems each designed for a specific set of site conditions. However, there are several system components that are common to most systems. These include the following:

1. A septic tank - a concrete tank that is designed to receive wastewater from the house and to provide a degree of pretreatment for the waste, chiefly through removal of some of the solids in the waste. Note that these solids accumulate over time and necessitate periodic pumping of the septic tank. Currently septic tanks are equipped with two access risers (normally constructed of concrete), which are designed to be at least 6 inches above the ground surface to prevent surface and shallow groundwater from entering the septic tank and to provide access for maintenance. **Care must be taken not to damage or cover these risers so that water inflow / infiltration can be prevented and the tank can be accessed for maintenance.**
2. In some installations, a pump tank - a concrete tank, very similar to the septic tank, which contains a pump along with the associated controls / componentry. The pump tank and pump is designed to receive effluent from the septic tank, and pump the effluent to a disposal field located at a higher elevation and/or to a pressurized distribution network in the disposal field. **The pump tank also has an access riser which must be protected in a similar manner to that indicated for the septic tank.** Servicing of the pump tank components often necessitates the assistance of a professional such as a septic tank installer or Certified Subsurface System Operator. The latter is required for operation and maintenance of certain types of systems.
3. A disposal field - a series of subsurface trenches and lines that are designed to distribute the effluent into the soil and provide for the ultimate treatment and disposal of the effluent. There are numerous variations on the design of the disposal field, related chiefly to the type of system chosen, site constraints, etc. Dependent on the type of disposal system, you may have to maintain a contract with a Certified Subsurface System Operator for operation and maintenance of your wastewater disposal system.

Utilization of Your Wastewater Disposal System

In order to obtain the maximum efficiency and life expectancy from your system, the following simple procedures must be adhered to:

1. **Practice water conservation.** This can include many practical considerations such as not leaving the water running while you brush your teeth, not overfilling the tub, limiting time in the shower, not replacing low flow fixtures with those of higher flows, over rinsing dishes (allow the dishwasher to do its job), immediate repair of any leaking fixtures, running washing machines and dishwashers only when full, etc.

NOTE: Washing machines generate significant volumes of wastewater. As a result, laundry activities should be spread over the week as opposed to accumulating all of laundry until the weekend.

2. **Do not utilize your wastewater disposal system as a trash can by dumping nondegradables down your drains or toilet.** These include cigarette butts, sanitary products, grease, plastics, disposable diapers, etc. Avoid use of garbage disposals. Do not retrofit garbage disposals unless the system is specifically permitted for their use. Also, do not dump harmful chemicals down the drain. These include petroleum products, paint, paint thinner, pesticides, antifreeze, etc.

Maintenance of Your Wastewater Disposal System

Every wastewater disposal system requires maintenance in order to function properly. The specific maintenance required is related to the type of system. The following are general considerations that apply to all systems.

1. **Protect your wastewater disposal system components including the tanks, access risers, disposal field and associated components.** Do not drive or park on any portion of the system. The area over the disposal field should be left undisturbed with the grass cover being maintained as you would your lawn. Location of trees and shrubs on or in close proximity to the disposal field is not recommended since roots may clog or damage your drain lines. Additionally, great care must be exercised when considering the addition of any structure(s) to the site. The location of any appurtenances cannot encroach on the installation or repair areas for your system. It is not recommended that irrigation systems be located in proximity to the disposal system since their construction can cause system damage and/or result in additional hydraulic load on the disposal field.
2. **Protect the system from excess surface and shallow groundwater.** The land surface on and around the wastewater disposal system should be landscaped to shed rainfall and runoff and prevent ponding. Be sure that foundation drains, runoff from roofs and drives, etc. are diverted away from the disposal system.
3. **Regularly have the septic tank / pump tank pumped and cleaned by a permitted septage hauler.** Although the necessary frequency of pumping varies with the household and system, most tanks need **pumping at a frequency of 3-5 years** and at any time solids occupy one-fourth to one-third of the septic tank liquid depth.

Note that all septic tanks being currently installed incorporate an effluent filter within the outlet compartment of the septic tank. This filter is to be cleaned anytime the septic tank is pumped. If plumbing becomes sluggish, this filter should be checked. If filter service is found to be necessary, the tank is to be pumped, the filter cleaned and the filter reinstalled.

4. **Be alert to warning signs that your system may not be functioning properly.**
These include sewage surfacing over the disposal system, sewage backups / slow draining in the house, lush growth over the disposal system, sewage odors, etc.
5. **Do not make or allow repairs to your system unless all necessary permits are obtained from Wake County Department of Environmental Services.**
6. **Commercial additives for septic tank systems** - It has generally not been demonstrated that these additives enhance the function of septic systems or reduce the need for tank pumping and other necessary maintenance.
7. **Special maintenance considerations** - As already alluded to, some of the more complex wastewater disposal systems require that you retain / maintain the services of a Certified Wastewater System Operator in order to comply with Laws and Rules and maintain a valid operation permit for your system. In Wake County this maintenance requirement should be recorded with Register of Deeds if applicable.

Where Do I Obtain Information and Assistance?

If you are purchasing a new home, you should request a copy of your wastewater system permit from the builder / seller along with information regarding any special maintenance requirements. You may also obtain information and assistance from the **Wake County Department of Environmental Services**, 336 Fayetteville Street Mall, Raleigh, NC, Telephone (919) 856-7400. The County also maintains an Internet web site at <http://www.wakegov.com/environment/Pages/default.aspx>. This site contains much useful information and a number of links.

BSM 7/18/18

ALTERNATIVE SEWAGE DISPOSAL SYSTEM MAINTENANCE SCHEDULE
To Be Recorded In The Register Of Deed’s Office In Wake County.

Owner/Grantor _____ Deedbook and Page _____
PIN No. _____ Date Installed _____
Subdivision Name _____ Lot No. _____
System Designed by _____ Installer _____

AN ALTERNATIVE OR NON-TRADITIONAL SEWAGE DISPOSAL SYSTEM USING AN ENGINEER DESIGNED FLOW RATE MODIFICATION PURSUANT TO SESSION LAW 2014-120 SECTION 53 HAS BEEN INSTALLED ON THIS PROPERTY. The design specifications and locations for alternative sewage disposal systems are specified or authorized in Regulations Governing Wastewater Treatment and Dispersal in Wake County effective November 21, 1988, amended effective May 23, 2002, amended October 27, 2011. As A Condition Of Issuance Of This Improvements/Operation Permit, The Property Owner Hereby Grants The Wake County Department Of Environmental Services A Right Of Access To The System During Regular Working Hours For Purposes Of Monitoring Compliance With State And Local Regulations, Recorded Maintenance Agreements And Certified Operator Compliance. This permit requires the use of **pressure manifold distribution to a mode of subsurface wastewater dispersal**. Experience and study have shown that pressure manifold systems require routine maintenance in order to function satisfactorily. In as much as each system must be individually designed and sited, special maintenance requirements may apply to a specific installation; however, the following maintenance schedule is applicable to all pressure manifold systems. This permit also requires the use of **pre-treatment and a mode of subsurface wastewater dispersal for the repair system**, which will require a contract with a Certified Operator to perform maintenance on the system as described in the above referenced regulations. **Due to this requirement, the initial system must be inspected by a certified inspector or operator at a frequency of at least once every five years and a report submitted.** For additional information, technical assistance or if a malfunction of the system occurs, contact the Wake County Department of Environmental Services, Telephone: 919-856-7400.

<u>System Component</u>	<u>Frequency</u>	<u>Maintenance</u>
1. Septic Tank	6-12 months	Check riser condition (must be accessible from ground surface), excess in/exfiltration, entry of water at riser, and solids accumulation.
	1-3 years	Pump septage.
2. Pump/Dosing Tank	6-12 months	Check riser conditions (must be accessible from ground surface),excess in/exfiltration, entry of water at riser, and solids accumulation. Pump sludge accumulation as required and when septic tank is pumped. Check pump(s), controls, floats, electrical connections, and alarm for proper operation. Wash (hose) sludge accumulation from pump housing.
3. Supply lines	6-12 months	Check for settling, pipe exposure and leakage. Includes Manifold(s).
4. Drain Field(s)	1-4 weeks	Maintain vegetative cover (mow grass and remove weeds and brush).
	6-12 months	Check for settling, erosion and surfacing of effluent. Check site drainage, eliminate low or settled areas and divert surface or shallow groundwater movement around fields.
5. Pressure Manifold	6-12 months	Check and reset pressure head, flush sludge from pressure manifold (any discharge sludge and effluent is to be treated with a chlorine solution).
6. Sampling	12 Months	Influent and Effluent sampling may be requiried once per year to ensure adhearance to domestic strength wastewater standards.
7. General	At all times	Prohibit vehicular or equipment traffic on ground absorption field. Prohibit tillage (gardening) or other soil disturbance over ground absorption field. Practice water conservation to reduce waste water load on system. Do no permit entry or grease and non-domestic waste to system. Use of a garbage disposal is <u>prohibited</u> . Addition of chemical or biological additives has <u>not</u> been demonstrated to be necessary to maintain proper system function. Prevention of root intervention on lateral lines and trenches may be necessary on certain sites. Surface and groundwater diversion structures must be maintained. <u>Adherence to permitted flow rate.</u>

This system is permitted under S.L. 2014-120 for engineer flow reduction utilizing low flow fixtures and technologies, all of which must remain in use for the life of the applicable system. Neither the State nor any local government shall be liable for any damages by a system approved or permitted pursuant to this section. Initial system must be inspected by a certified inspector or operator at a frequency of at least once every five years and a report submitted. A certified operator is required for the life of the system, once repair system is installed.

Signature of Property Owner

Date

NORTH CAROLINA _____ County, I, a Notary Public of the County and State aforesaid, certify that _____ Owner, Personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this ____ day of _____ 20____.

My commission expires _____ Notary Public _____

PROPOSED PLOT PLAN FOR:
**TALL TRADITIONS BUILDING
COMPANY LLC**

LOT 18
ALPINE CREEK
BOOK OF MAPS 2019 PAGE 1408,
PIN: 1788-87-3863
BARTONS CREEK TOWNSHIP
WAKE COUNTY, NORTH CAROLINA
ADDRESS: 1421 ALPINE CREEK DRIVE

REFERENCES

- 1. B.M. 2019 PG 1408
- 2. WAKE COUNTY GIS.

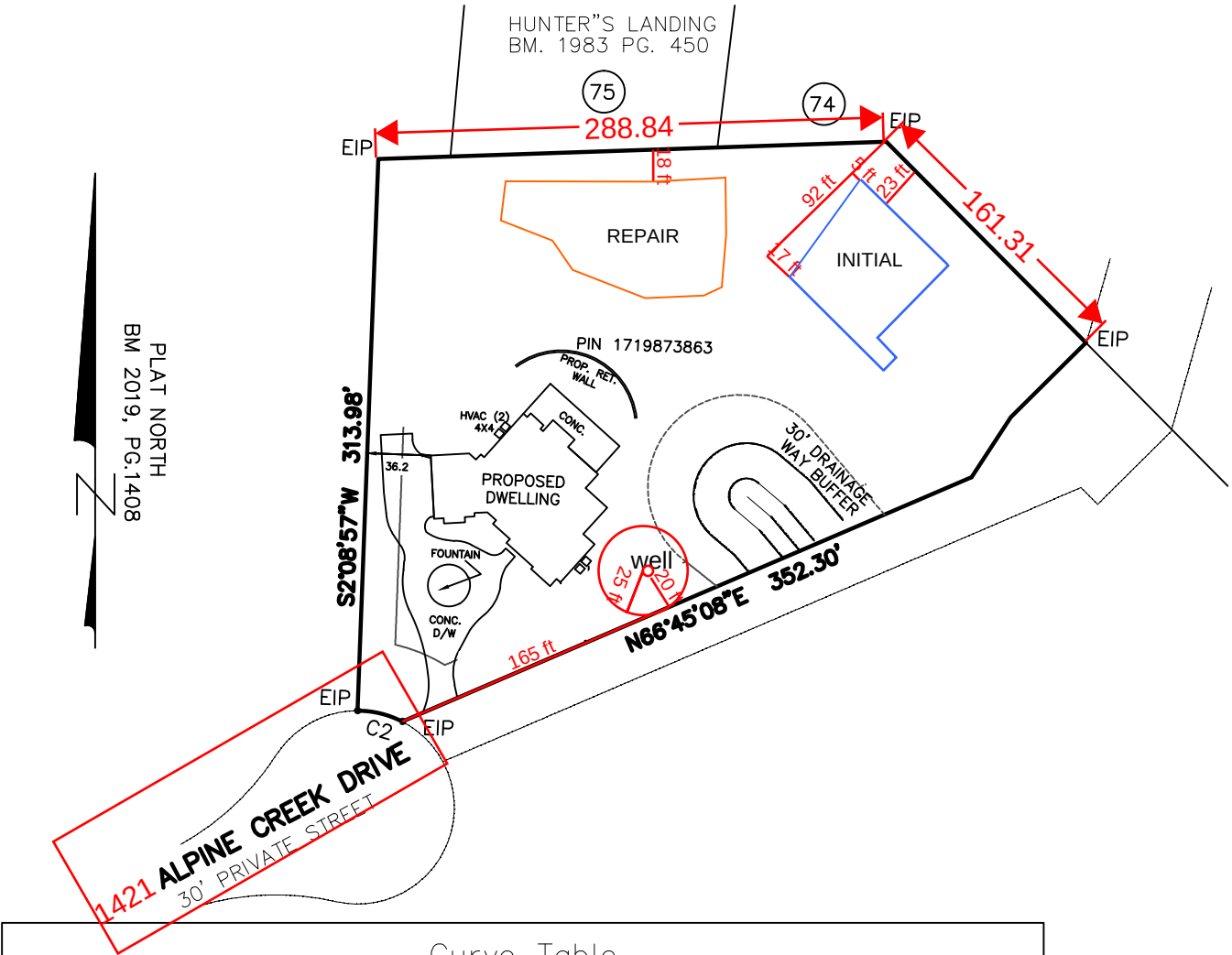
PROPOSED IMPERVIOUS
DWELLING_____5,403 SF
CONCRETE_____4,804 SF
TOTAL _____11,372 SF
85% OF ALLOWABLE IS PROPOSED



CA PART - A

- NOTES
- 1. AREA BY COORDINATE CALCULATION.
 - 2. PROPERTY IS SUBJECT TO ALL EASEMENTS AND RIGHT-OF-WAYS OF RECORD PRIOR TO THE DATE OF
 - 3. NO GRID MONUMENTS FOUND WITHIN 2000' OF PROPERTY.
 - 4. THIS PLAT IS A CORRECT REPRESENTATION OF THE LAND PLATTED AND HAS BEEN PREPARED IN CONFORMITY WITH NORTH CAROLINA STANDARDS, GS47-30, AND REQUIREMENTS OF LAW, BUT A NORTH CAROLINA LICENSED ATTORNEY-AT-LAW SHOULD BE CONSULTED REGARDING CORRECT OWNERSHIP, WIDTH AND OWNERSHIP OF EASEMENTS AND OTHER TITLE QUESTIONS REVEALED BY A TITLE EXAMINATION.

Required Setbacks	
Front	40
Side	20
Rear	30
Corner	



Curve Table					
CURVE #	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C2	27°29'26"	55.00	26.39	N76°15'08"W	26.14

LINE TABLE		
LINE #	BEARING	LENGTH
L1	N45° 13' 08.81"E	59.94
L2	N33° 13' 44.59"E	40.89

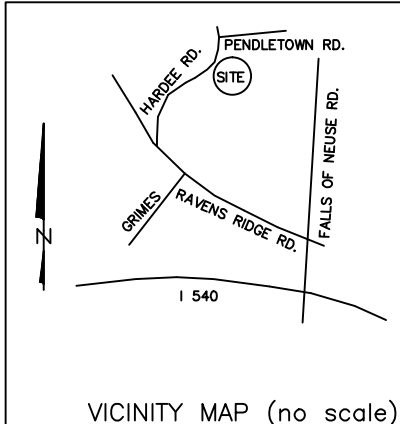
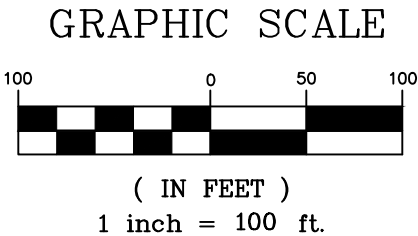
LEGEND
EIP=EXISTING IRON PIPE
EIS=EXISTING IRON STAKE
IPS=IRON PIPE SET
R/W=RIGHT OF WAY
[0000] = STREET ADDRESS
13,346 S.F. = MAX. IMPERVIOUS AREA

THIS PROPERTY IS NOT LOCATED IN A
F.E.M.A. 100 YEAR FLOOD HAZARD AREA.
REFERENCE: F.E.M.A. COMMUNITY PANEL NO. 3720078800 J
EFFECTIVE DATE: 05/02/2006

STEWART-PROCTOR
ENGINEERING and SURVEYING
319 CHAPANOKE ROAD, SUITE 106
RALEIGH, NC 27603 (LICENSE # P-0148)
TEL. 919 779-1855 FAX 919 779-1661

DATE 09/17/19 DRAWING

SCALE 1"=100'

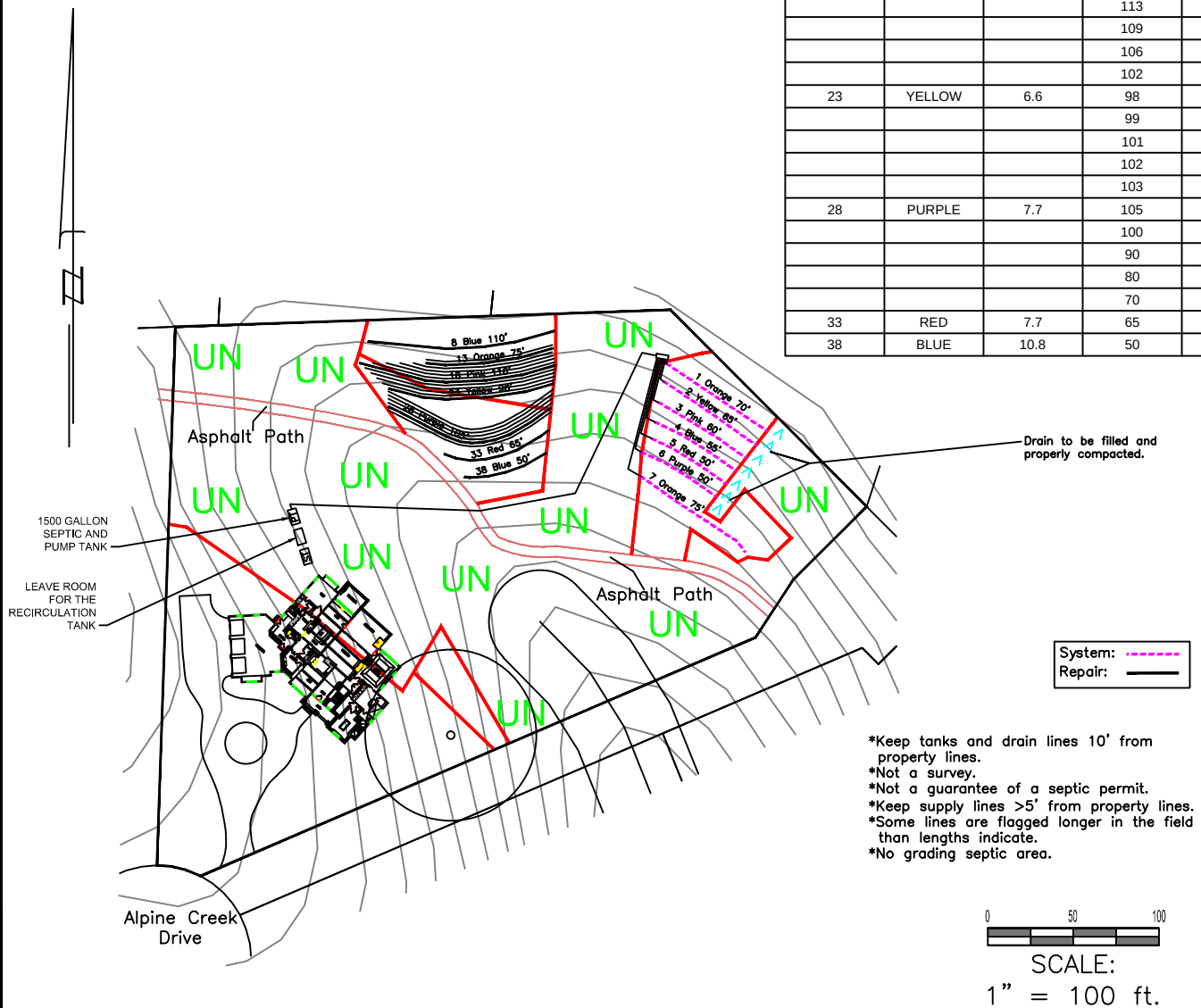


System: Pressure Manifold
 Lines: 1-7, (425')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom

Repair: Subsurface Drip
 Lines: 8-38, (>1,600')
 Accepted Status System
 0.15 Soil LTAR
 12" Trench Bottom

CA PART - B(1)

LINE SCHEDULE SYSTEM				
LINE NUMBER	COLOR	FIELD ELEVATION	LENGTH	DESIGN LENGTH
1	ORANGE	3.1	70	70
2	YELLOW	4.5	65	65
3	PINK	5.8	60	60
4	BLUE	6.9	55	55
5	RED	7.8	50	50
6	PURPLE	8.9	50	50
7	ORANGE	10.2	75	75
8	BLUE	3.1	110	
			103	
			96	
			89	
			82	
13	ORANGE	4.4	75	
			83	
			91	
			99	
			107	
18	PINK	5.6	116	
			113	
			109	
			106	
			102	
23	YELLOW	6.6	98	
			99	
			101	
			102	
			103	
28	PURPLE	7.7	105	
			100	
			90	
			80	
			70	
33	RED	7.7	65	
38	BLUE	10.8	50	



Central Carolina Soil Consulting, PLLC
 1900 South Main Street, Suite 110
 Wake Forest, North Carolina 27587
 Phone (919)569-6704 Fax (919)569-6703

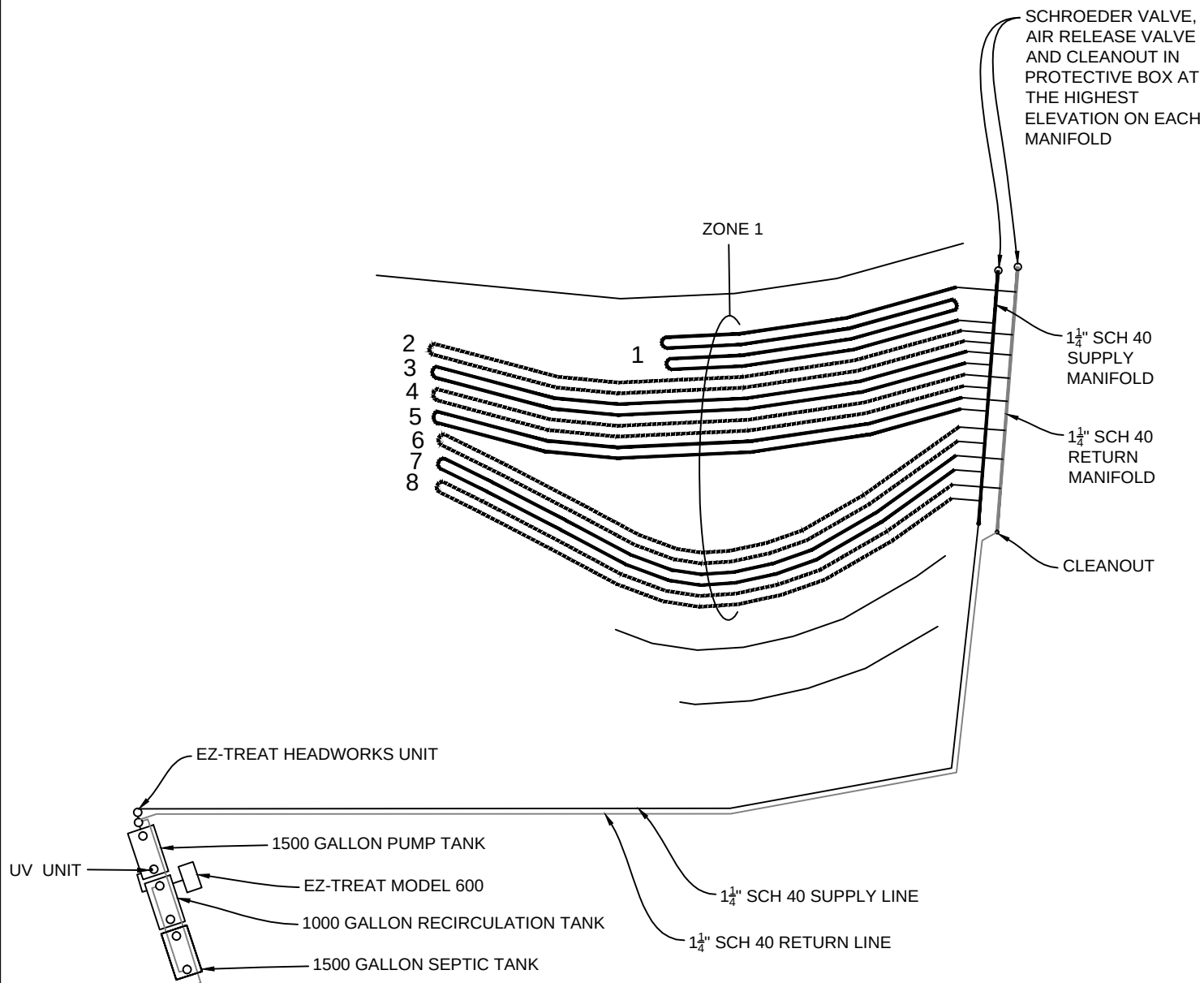
5-Bedroom Septic Layout
 With an Engineered Flow Reduction
 Lot 18, Alpine Creek Subdivision
 Wake County, North Carolina

Job# : 2988
 Drawn By : TMB
 Date : 11/05/2019
 Revision: 00/00/0000

DRIP SYSTEM DETAIL

(NOT TO SCALE)

CA PART - B(2)



Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, North Carolina 27587
Phone (919)569-6704 Fax (919)569-6703

DRIP SYSTEM DETAIL
Alpine Creek Lot 18
Wake County, North Carolina

Job# : 2988
Drawn By : TMB
Date : 11/05/2019
Revision: 11/21/2019



CA PART - C

TEL 919 856 7400
FAX 919 856 7407

Environmental Services

Water Quality Division

336 Fayetteville St. • P.O. Box 550 • Raleigh, NC

Innovative Product Owner Authorization of Use Certification

D# WRP-026251-2019

Building Permit # RBPR-026213-2019

Address: 1421 Alpine Creek - Lot 18

PIN: 1719873863

I, Craig W Adams hereby request the innovative wastewater
Print Owner Name

drip system marked below to be used in my wastewater treatment and dispersal system for my property located at the above address and PIN number, and permitted under the above Wake County Wastewater System Permit number. If Advanced Treatment is Required, the level of treatment is also marked below, and a separate innovative authorization letter will be filled out, if required, for that product.

[Signature]
Owner Signature

11-15-19
Date

Generic Name

☐ Perc-Rite Drip
☐ Perc-Rite Drip
☐ Delta Drip
☒ E-Z Drip
☐ Geoflow Drip

Proprietary Name

American Perc-Rite Subsurface Drip System, Anaerobic
American Perc-Rite Subsurface Drip System, Aerobic
Delta Subsurface Drip System
E-Z Drip Subsurface Wastewater Drip System
Geoflow's Subsurface Drip System

Innovative Approval

IWWS-1993-1-R7A
IWWS-93-1-R6B
IWWS-2001-1
IWWS-2007-1-R2
IWWS-2000-2R

Treatment Level: ☐ Anaerobic
☐ NSF40
☐ TS-I
☐ TS-II



Environmental Services

TEL 919 856 7400
FAX 919 856 7407

Water Quality Division

336 Fayetteville St. • P.O. Box 550 • Raleigh, NC 27602

Innovative Product Owner Authorization of Use Certification

D# WRP-026251-2019

Building Permit # RBPR-026213-2019

Address: 1421 Alpine Creek - Lot 18

PIN: 1719873863

I, Craig Q. Adams hereby request the innovative wastewater
Print Owner Name

advanced treatment unit marked below to be used in my wastewater treatment and dispersal system for my property located at the above address and PIN number, and permitted under the above Wake County Wastewater System Permit number. The level of treatment is also marked below. Any additional Innovative Products needed for this project will have their own Authorization of use filled out independently.

[Signature]
Owner Signature

11/11/19
Date

Generic Name

Proprietary Name

Innovative Approval

☐ Anua	Puraflo Peat Biofilter System	IWWS-98-I-R3
☐ Bioclere	Bioclere Modified trickling Filter System	IWWS-2002-I-R1
☐ E-Z Treat 1200	E-Z Treat Model 1200 Pretreatment System	IWWS-2014-R3
☒ E-Z Treat 600	E-Z Treat Model 600 Pretreatment System	IWWS-2015-03-R2
☐ Norweco	Norweco Singulair ATU/Sand Filter	IWWS-99-3
☐ Bio-Kinetic	Norweco Bio-Kinetic System	IWWS-2000-1
☐ AdvanTex RT	AdvanTex AX-RT Treatment System (Models AX20-RT and AX25-RT)	IWWS-2015-01-R1
☐ AdvanTex	Advantex Treatment Systems (AX20 and AX100)	IWWS-2004-3-R4
☐ Ecoflo	Ecoflo Peat Biofilter System	IWWS-2000-3-R4
☐ Sand Filter	Pressure Dosed Sand Filter Pretreatment System	IWWS-97-I

Treatment Level: ☐ NSF40

☐ TS-I

☒ TS-II

☐ Reuse



**Department of Environmental Services
Wake County**

Approved by

A handwritten signature in black ink, appearing to read "Matt Burdette".

Date : 12022019

Review of this document has been made only for conformance with the design concept of the project and approval shall not relieve the designer and/or contractor from responsibility for any errors therein or for furnishing the materials, and equipment of proper dimension, size, quantity, quality and all performance characteristic to meet the requirements and intent of the contract documents.

Pressure Manifold Septic System Design

for

**Alpine Creek Subdivision Lot 18
Raleigh, North Carolina**

Designed by:

**Matt Burdette
Central Carolina Soil Consulting, PLLC
Wake Forest, North Carolina**

11/07/2019

Alpine Creek Subdivision Lot 18

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Alpine Creek Subdivision Lot 18
Contact Information

Client: Tall Traditions
Attn: Richard Tilley
Street Address: 8916 Lindenshire Road
Raleigh North Carolina, 27615
Phone: 919-427-6284
Fax:

Designer: Central Carolina Soils Consulting
Attn: Matt Burdette
Street Address: 1900 Main Street Suite 110
Wake Forest, NC 27587
Phone: 919-569-6704
Fax: 919-569-5703

Alpine Creek Subdivision Lot 18

Layout/Design Specifications

Facility Type:	Single Family Home
# of Bedrooms:	5
Daily Flow:	480 gal/day with Engineered flow Red
L.T.A.R.:	0.30 gal/day/sq.ft
Trench Depth:	per wake county in
Trench Width:	36 in
Stone Depth:	Ez-Flow in
Manifold Length:	60 in
Manifold Diameter:	4 in sch 80pvc
Supply Line Length:	270 ft
Supply Line Diameter:	2 in sch 40pvc
Total Supply Line Volume:	49.68 gallons
Friction Loss + Fitting Loss:	14.92 ft includes 70' for fittings and a 25% safty factor
Design Head:	2 ft
Elevation Head:	7.30 ft
Total Head:	24.22 ft
Dose Volume:	207.44 gals
% of Pipe Vol.	.75
Drawdown:	6.8 in @ 30.65 gal/in
Pump Run Time:	4.8 Mins
Control Panel:	SJE Rhombus Model112 control panel (or approved equivalent)
Pump:	Zoeller 140 Flow-Mate (or approved equivalent)
Septic Tank Effluent Filter:	Zoeller 170-0144 residential effluent filter (or approved equivalent)
Septic Tank:	1500 gallon
Pump Tank:	1500 gallon

Alpine Creek Subdivision Lot 18 SYSTEM TAP CHART

Bench Mark: 0 = 100.00
Pump tank elevation: 96.00

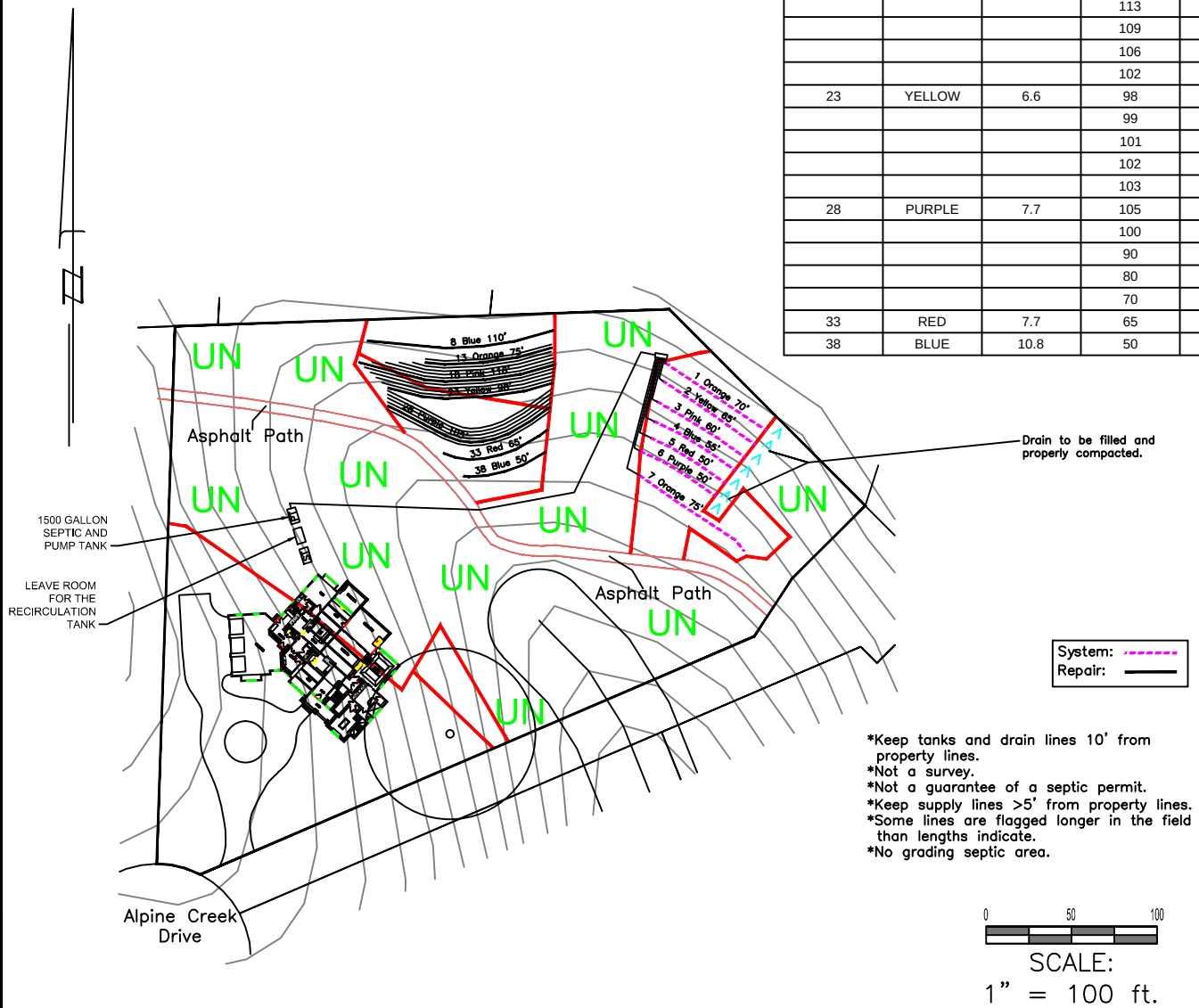
Manifold elev: 97.90
Pump elev: 90.60

line	color	rod read	elevation	length	hole size	flow/tap	gal/day	trench area	LINE LTAR
1	Orange	3.10	96.90	70	1/2in SCH 40	7.11	78.91	210	0.3758
2	Yellow	4.50	95.50	65	1/2in SCH 40	7.11	78.91	195	0.4047
3	Pink	5.80	94.20	60	1/2in SCH 80	5.48	60.82	180	0.3379
4	Blue	6.90	93.10	55	1/2in SCH 80	5.48	60.82	165	0.3686
5	Red	7.80	92.20	50	1/2in SCH 80	5.48	60.82	150	0.4055
6	Purple	8.90	91.10	50	1/2in SCH 80	5.48	60.82	150	0.4055
7	Orange	10.20	89.80	75	1/2in SCH 40	7.11	78.91	225	0.3507
	P-TANK	4.00	96.00						
		total	feet =	425	gal/min =	43.25		<u>LTAR =</u>	0.30
				<u>Des. Flow</u>	480			(ltar + 5%)	0.32
				Pump Run=	11.10			(ltar W/ INOV)	0.40
								(ltar + 5%)	0.42

Comments: 5-bedroom with an engineered flow reduction

Repair: Subsurface Drip
Lines: 8–38, (>1,600')
Accepted Status System
0.15 Soil LTAR
12" Trench Bottom

LINE SCHEDULE SYSTEM				
LINE NUMBER	COLOR	FIELD ELEVATION	LENGTH	DESIGN LENGTH
1	ORANGE	3.1	70	70
2	YELLOW	4.5	65	65
3	PINK	5.8	60	60
4	BLUE	6.9	55	55
5	RED	7.8	50	50
6	PURPLE	8.9	50	50
7	ORANGE	10.2	75	75
8	BLUE	3.1	110	
			103	
			96	
			89	
			82	
13	ORANGE	4.4	75	
			83	
			91	
			99	
			107	
18	PINK	5.6	116	
			113	
			109	
			106	
			102	
23	YELLOW	6.6	98	
			99	
			101	
			102	
			103	
28	PURPLE	7.7	105	
			100	
			90	
			80	
			70	
33	RED	7.7	65	
38	BLUE	10.8	50	



Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, North Carolina 27587
Phone (919)569-6704 Fax (919)569-6703

5-Bedroom Septic Layout
With an Engineered Flow Reduction
Lot 18, Alpine Creek Subdivision
Wake County, North Carolina

Job# : 2988

Drawn By : TMB

Date : 11/05/2019

Revision: 00/00/0000

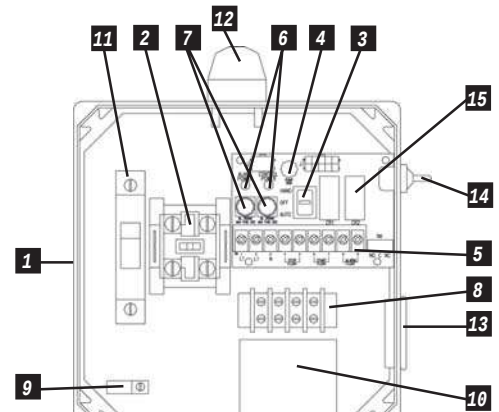
MODEL 112 Control Panel

Single phase, simplex motor contactor control.

The Model 112 control panel provides a reliable means of controlling one 120, 208, or 240 VAC single phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system.

PANEL COMPONENTS

1. **Enclosure** measures 8 x 8 x 4 inches (20.32 X 20.32 X 10.16 cm). Choice of NEMA 1 (steel for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic with removable flanges for outdoor or indoor use).
* Options selected may increase enclosure size and change component layout.
2. **Magnetic Motor Contactor** controls pump by switching electrical lines.
3. **HOA Switch** for manual pump control (mounted on circuit board).
4. **Green Pump Run Indicator Light** (mounted on circuit board).
5. **Float Switch Terminal Block** (mounted on circuit board).
6. **Alarm and Control Fuses** (mounted on circuit board).
7. **Alarm and Control Power Indicators** (mounted on circuit board).
8. **Pump Input Power and Pump Connection Terminal Block**
9. **Ground Lug**
10. **Terminal Block Installation Label**
11. **Circuit Breaker** (optional) provides pump disconnect and branch circuit protection.



Model Shown 1121W914X

STANDARD ALARM PACKAGE

12. **Red Alarm Beacon** provides 360° visual check of alarm condition.
Note: NEMA 1 style utilizes a door mounted indicator in lieu of a beacon.
13. **Alarm Horn** provides audio warning of alarm condition (83 to 85 decibel rating).
Note: NEMA 1 style utilizes an internally mounted buzzer in lieu of horn.
14. **Exterior Alarm Test/Normal/Silence Switch** allows horn and light to be tested and horn to be silenced in an alarm condition. Alarm automatically resets once alarm condition has been cleared.
15. **Horn Silence Relay** (mounted on circuit board).

NOTE: other options available.

FEATURES

- Entire control system (panel and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Standard package includes three 20' Sensor Float® control switches
- Complete with step-by-step installation instructions
- Three-year limited warranty



SJE
Rhombus
CONTROLS

PO Box 1708, Detroit Lakes, MN 56502

1-888-DIAL-SJE • 1-218-847-1317

1-218-847-4617 Fax

email: sje@sjerhombus.com

www.sjerhombus.com

SEE BACKSIDE FOR COMPLETE LISTING OF AVAILABLE OPTIONS.

112**1****W****9****1****4****H****3A, 8A, 8C, 15A****MODEL 112****ALARMPACKAGE**

0 = select options or no alarm package

1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)

ENCLOSURE RATING

I = Indoor, NEMA 1 (metal)

W = Weatherproof, NEMA 4X (engineered thermoplastic)

STARTING DEVICE

1 = magnetic motor contactor 120/208/240V

9 = magnetic motor contactor 120V only

PUMP FULL LOAD AMPS

0 = 0-7 FLA

1 = 7-15 FLA

2 = 15-20 FLA

3 = 20-30 FLA

PUMP DISCONNECTS

0 = no pump disconnect

1 = pull-out with safety deadfront in a 10"x8" enclosure

4 = circuit breaker 120V (select STARTING DEVICE option 9 above)

120/208/240V (select STARTING DEVICE option 1 above)

FLOAT SWITCH APPLICATION

H or L = pump down or pump up

X = no floats

WITH alarm package

WITHOUT alarm package

OPTIONS *Listed below*ENCLOSURE UPSIZE - If you selected 3 or more of the ★ options, or one ★★ option ,
a one-time enclosure upsize fee would apply.**If additional features are required, call the factory for a quote on either a
SJE-Rhombus Pro-Line or Engineered Custom control panel.****CODE DESCRIPTION**

- ☐ 1A Red beacon only / no audio
(must select 1E if floats included)
- ☐ 1C Horn only / no visual
(must select 1E if floats included)
- ☐ 1E Alarm float
- ☒ 3A Alarm flasher
- ☐ ★ 3B Manual alarm reset
- ☐ ★ 4A Low level cutout
(select option 4D if floats included)
- ☐ ★ 4B Red low-level indicator & alarm
(must select 4A also)
- ☐ 4D Low-level float
- ☐ ★ 5A Thermal cutout/heat sensor auto
reset (for pumps w/thermal switch leads)
- ☐ ★★ 5E Seal failure circuit & red indicator (2 wire)
- ☐ 6A Auxiliary alarm contact, form C type
- ☒ ★ 8A Elapsed time meter
- ☒ ★ 8C Event (cycle) counter
- ☐ ★★ 9_A Pump overload
specify amperage after number 9 followed by letter "A".
Example: 912A = 12 amp pump.
- ★★ ☐ 0-25 FLA
- ★★ ☐ 25-30 FLA
- ☐ 10E Lockable latch - NEMA 4X
- ☐ 10E Lockable latch - NEMA 1
- ☐ ★ 10F Lightning arrester
- ☐ ★ 10K Anti-condensation heater

CODE DESCRIPTION

- ☐ 11C NEMA 1 alarm panel *must select option 6A*
- ☐ 11D NEMA 4X alarm panel *must select option 6A*
- ☐ ★★ 14B Main disconnect (rotary style, mounted through door)
non-fused
- ★★ ☐ 0-20 FLA (total of both pumps)
- ★★ ☐ 20-30 FLA (total of both pumps)
- ☒ 15A Control / alarm circuit breaker
Does not include the circuit board as in standard.
- ☐ 16A 10' cord in lieu of 20' (per float)
- ☐ 16B 15' cord in lieu of 20' (per float)
- ☐ 16C 30' cord in lieu of 20' (per float)
- ☐ 16D 40' cord in lieu of 20' (per float)
- ☐ 17A SJE SignalMaster® / mounting strap ● (per float)
- ☐ 17B SJE SignalMaster® / externally weighted ● (per float)
- ☐ 17C Sensor Float® / internally weighted ▲ (per float)
- ☐ 17D Sensor Float® / externally weighted ▲ (per float)
- ☐ 17E Sensor Float® Mini / pipe clamp ▲ (per float)
- ☐ 17F Sensor Float® Mini / externally weighted ▲ (per float)
- ☐ 19T TOA (Test/Off/Automatic) switch and pump run light through
door mounted
- ☐ 19U HOA (Hand/Off/Automatic) switch and pump run light through
door mounted
- ☐ 19X Door mounted pump run indicator
- ☐ 21A SJE PumpMaster® in lieu of on/off switches ●
- ☐ 21B SJE PumpMaster® Plus in lieu of on/off switches ●
- ☐ 21C Super Single® in lieu of on/off switches ▲
- ☐ 21D Double Float® in lieu of on/off switches ▲

● Mechanically-activated ▲ Mercury-activated

SAMPLE**MODEL****112****1****W****9****1****4****H****3A 8A**

Alarm Package

Enclosure Rating

Starting Device

Pump Full Load Amps

Pump Disconnect

Float Switch Application

Options: Flasher, Elapsed Time Meter

QUALITY PUMPS SINCE 1939™

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



ZOELLER
PUMP CO.



SECTION: 2.20.045

FM1502

0701

Supersedes

1200

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<http://www.zoeller.com>

THESE FEATURES

- Durable Cast Iron construction.
- Non-Clogging bronze vortex impeller design, passes 1/2" solids.
- Oil-filled hermetically sealed 1 HP, single phase, 3480 RPM motor, with thermal over load protection.
- Available in both single or double shaft seal designs.
- Carbon/Ceramic seals.
- Assembled with Stainless Steel bolts.
- Oil lubricated bearings.
- 15' UL Listed Neoprene cord with molded plug cap and ground wire.
- 1 1/2" NPT vertical discharge.
- Stainless steel lifting handle.
- BN and BE models include a variable level float switch and 1 1/2" X 2" PVC adapter fitting.
- Operates at temperatures to 130°F - 54°C in effluent or dewatering applications.
- Corrosion resistant powder coated epoxy finish.

Note: The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles.

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Manufacturers of . . .

QUALITY PUMPS SINCE 1939™

140 / 4140 Cast Iron Series

(For Pump Prefix Identification see News & Views 0052)

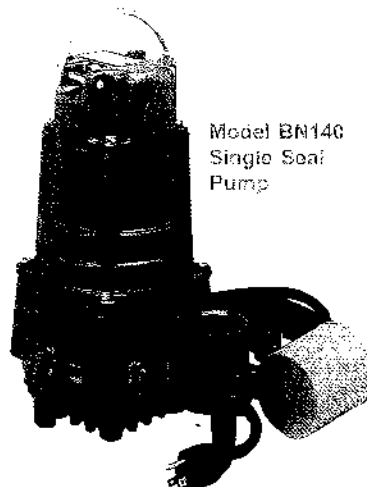
"FLOW-MATE"

FOR SEPTIC TANK - LOW PRESSURE PIPE (LPP)
AND ENHANCED FLOW STEP SYSTEMS

EFFLUENT

OR DEWATERING PUMPS
SUBMERSIBLE

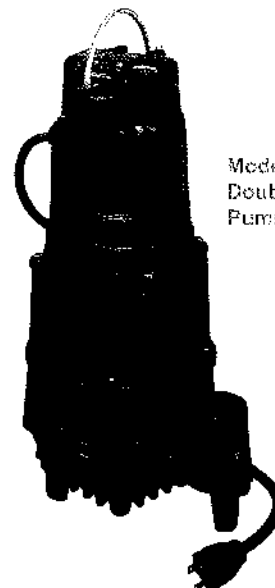
1 1/2" NPT DISCHARGE



Model BN140
Single Seal
Pump



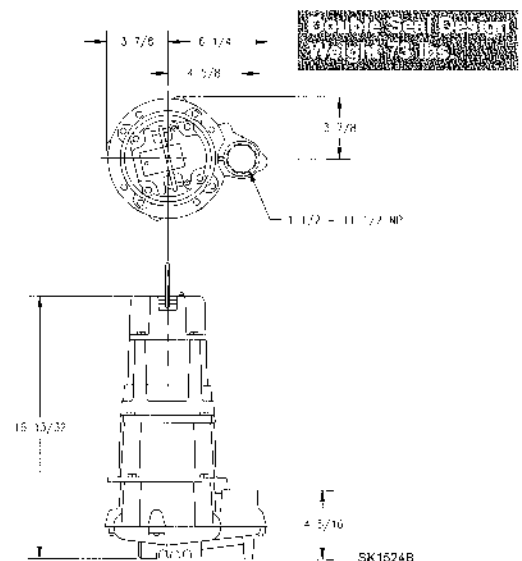
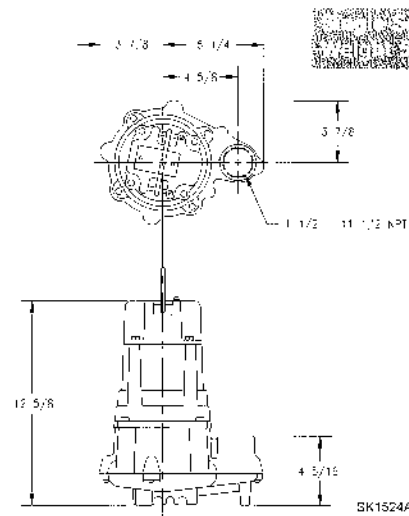
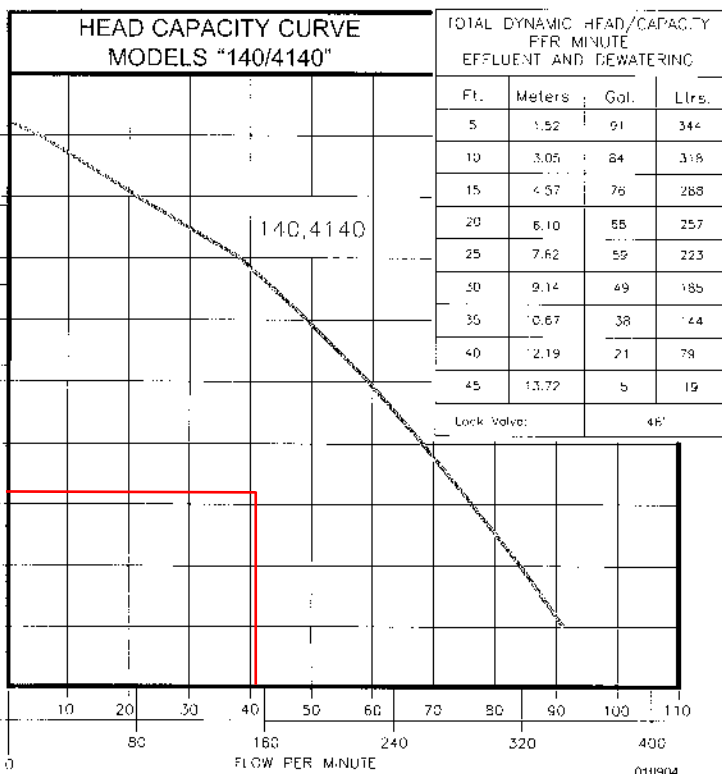
Model 140
Single Seal
Pump



Model 4140
Double Seal
Pump

MODELS AVAILABLE

- Nonautomatic
- 1 HP, 1Ph 115V or 230V



CONSULT FACTORY FOR SPECIAL APPLICATIONS

- Electrical alternators, for duplex systems, are available and supplied with an alarm.
- Mechanical alternators, for duplex systems, are available with or without alarms.
- Control alarm systems are available for 1 phase pumps used in simplex system. See FM0732.
- Variable level control switches are available for controlling single phase systems.
- Double piggyback variable level float switches are available for variable level long cycle controls.
- Sealed Qwik-Box available for outdoor installations. See FM1420.
- Over 130°F. (54°C.) special quotation required.
- Refer to FM0806 for 200° F. applications.

140 Series - 53 lbs. 4140 Series - 73 lbs.

140/4140*** MODELS					Control Selection		
Model	Model	Volts-Ph		Mode	Amps	Simplex	Duplex
140	N4140	115	1	Non	15.0	1 or 1 & 5	2 or 3 & 4
4140	E4140	230	1	Non	7.5	1 or 1 & 5	2 or 3 & 4
4140	BN4140	115	1	Non	15.5	1 or 1 & 5	2 or 3 & 4
4140	BE4140	230	1	Non	7.5	1 or 1 & 5	2 or 3 & 4

SELECTION GUIDE

- Single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
- Mechanical alternator M-Pak 10-0072 or 10-0075.
- See FM0712 for correct model of Electrical Alternator E-Pak.
- Variable level control switch 10-0225 used as a control activator, specify duplex (3) or (4) float system.

CAUTION

All installation of controls, protection devices and wiring should be done by a certified licensed electrician. All electrical and safety codes should be followed including the most recent National Electric Code (NEC) and the Occupational Safety and Health Act (OSHA).

RESERVE POWERED DESIGN

For unusual conditions a reserve safety factor is engineered into the design of every Zoeller pump.



<http://www.zoeller.com>

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Manufacturers of...

"QUALITY PUMPS SINCE 1938"

QUALITY PUMPS SINCE 1939™

All information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



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SECTION: 3.20.065

FM1775

1101

Supersedes

0501

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ZOELLER ON-SITE WASTEWATER PRODUCTS

INTRODUCING ZOELLER SEPTIC SYSTEM FILTERS

Zoeller "WW" Residential Effluent Filter P/N 170-0078



The Zoeller "WW" residential filter gives your septic system protection like no other. Zoeller Company's patented design keeps your lateral fields safe with twice the filtration area of most residential filters. All of the filtration area is submerged, making the filter 100% effective. The best feature of the WW filter is that the sleeve section of the filter remains in the outlet tee when the main filter is removed for servicing. This will guarantee no solids larger than 1/16" reach the lateral fields during servicing. The Zoeller "WW" filter is ultimate protection.

Improve the performance of your septic system: The number one reason that septic systems fail is because the lateral field becomes clogged. By preventing solids larger than 1/16" from exiting to your drain field, the lifetime of your system can be greatly increased.

Only the clearest effluent to leave the tank: Located in the sanitary tee, this filter extends beneath the scum layer, above the sludge layer, and withdraws effluent from the clear water zone of the tank.

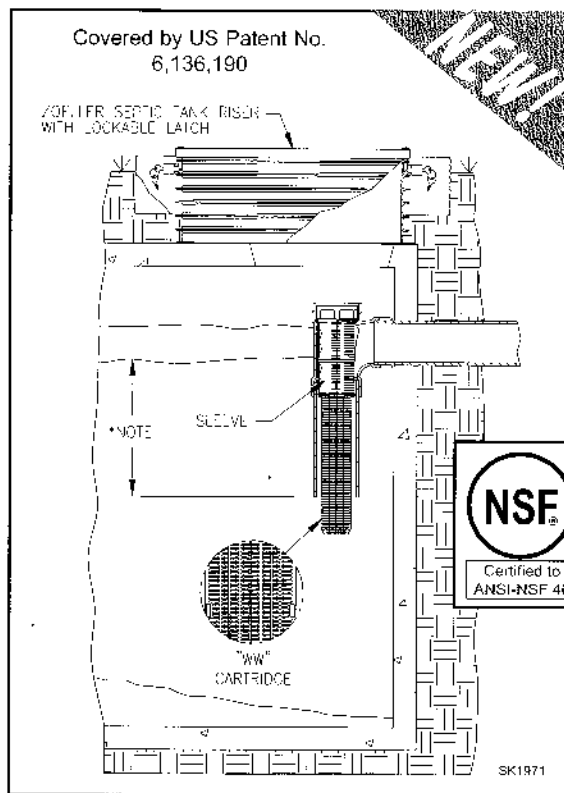


Also available
with sanitary
tee and filter
complete.

170-0144

Lowers maintenance costs: The filter must be serviced on a periodic basis to maintain peak performance. Under normal circumstances, the filter requires servicing when the septic tank is pumped. However, site specific circumstances may require more frequent service. A Zoeller Riser & Lid will make septic tank and filter maintenance an easy task.

Allows any responsible management entity to monitor the condition of the tank: During routine maintenance, the tank should be inspected to be sure unnecessary particulate is not getting into your tank (i.e. fruit peelings, cigarette filters, feminine hygiene materials, etc.). Check your local plumbing codes to determine how often your tank should be pumped. If sludge buildup becomes apparent on the bottom of your tank, then a more frequent pumping interval is suggested.



*NOTE: State and local plumbing codes may require a specific liquid penetration. For example, 25% - 45% into the liquid depth or 9" off the tank bottom.



P/N 013244

Distributed by:

ZOELLER
PUMP CO.

Zoeller Residential Septic Tank Effluent Filter Specifications

- Single family homes.
- 122 Linear Feet of 1/16" filtration.
- 1000 gpd.

All materials are noncorrosive in the septic tank environment. Sleeve is PVC, primary filter is polypropylene, Zoeller connection element is neoprene.

Installation or retrofit: The Zoeller Septic System Filter fits inside any 4" sanitary tee. Slide the filter cartridge into the filter sleeve. Lock the cartridge and sleeve together by holding the sleeve stationary and rotating the cartridge clockwise. Slide the assembled cartridge and sleeve into the sanitary tee at the tank's outlet. Ensure the sleeve latch is pointing toward the outlet of the septic tank before filter placement into the tee. The drain field is now protected from solids greater than 1/16".

Extension handle: Zoeller's effluent filter can be easily retrofitted with an extension handle. Attach a 1/2" PVC pipe to the top of the filter with properly installed stainless steel clamps. Cut off to appropriate length below the lid. A 1/2" PVC pipe can be added to the pipe for added leverage and control.

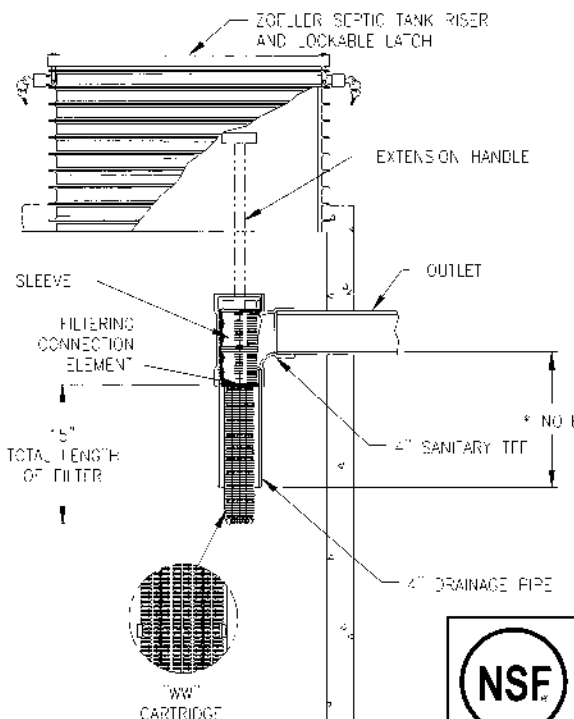
Maintenance: The filter cartridge can be maintained by rotating the cartridge counterclockwise and removing for cleaning. The sleeve should remain in the sanitary tee while cleaning the cartridge. To clean the cartridge, hold cartridge over septic tank opening and thoroughly flush with hose until clean, washing filtered trash back into septic tank. After cleaning the cartridge, it is imperative that the sleeve be cleaned inside and out, by reinserting the cartridge; turning it clockwise in the sleeve and removing the sleeve from the sanitary tee. The Zoeller filter should be cleaned each time the septic tank is pumped or when the need is indicated by slow flows from the house. More frequent cleanings will not hurt the filter and could even improve the performance of your septic tank. For installations that exceed the design flow rate of the tank, more frequent cleanings may be required or manifold more than one sanitary tee to accept more than one filter.

Cleaning, repair, and replacement: Follow the install and maintenance instructions above. For replacement components, call (800) 928-PUMP.

Warranty: Every Zoeller filter is guaranteed to be free from defects in materials and workmanship for the lifetime of the homeowner/purchaser. Free repair or replacement, excluding labor, will be made on return of the filter prepaid to the factory. This warranty is limited to product proven to be free from abuse or improper installation.

***NOTE:** State and local plumbing codes may require a specific liquid penetration. For example, 25% - 45% into the liquid depth or 9" off the tank bottom.

Covered by US Patent No.
6,136,190



SK1972

ALL ZOELLER ON-SITE WASTEWATER PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH LOCAL AND/OR STATE PLUMBING AND/OR HEALTH DEPARTMENT CODES.



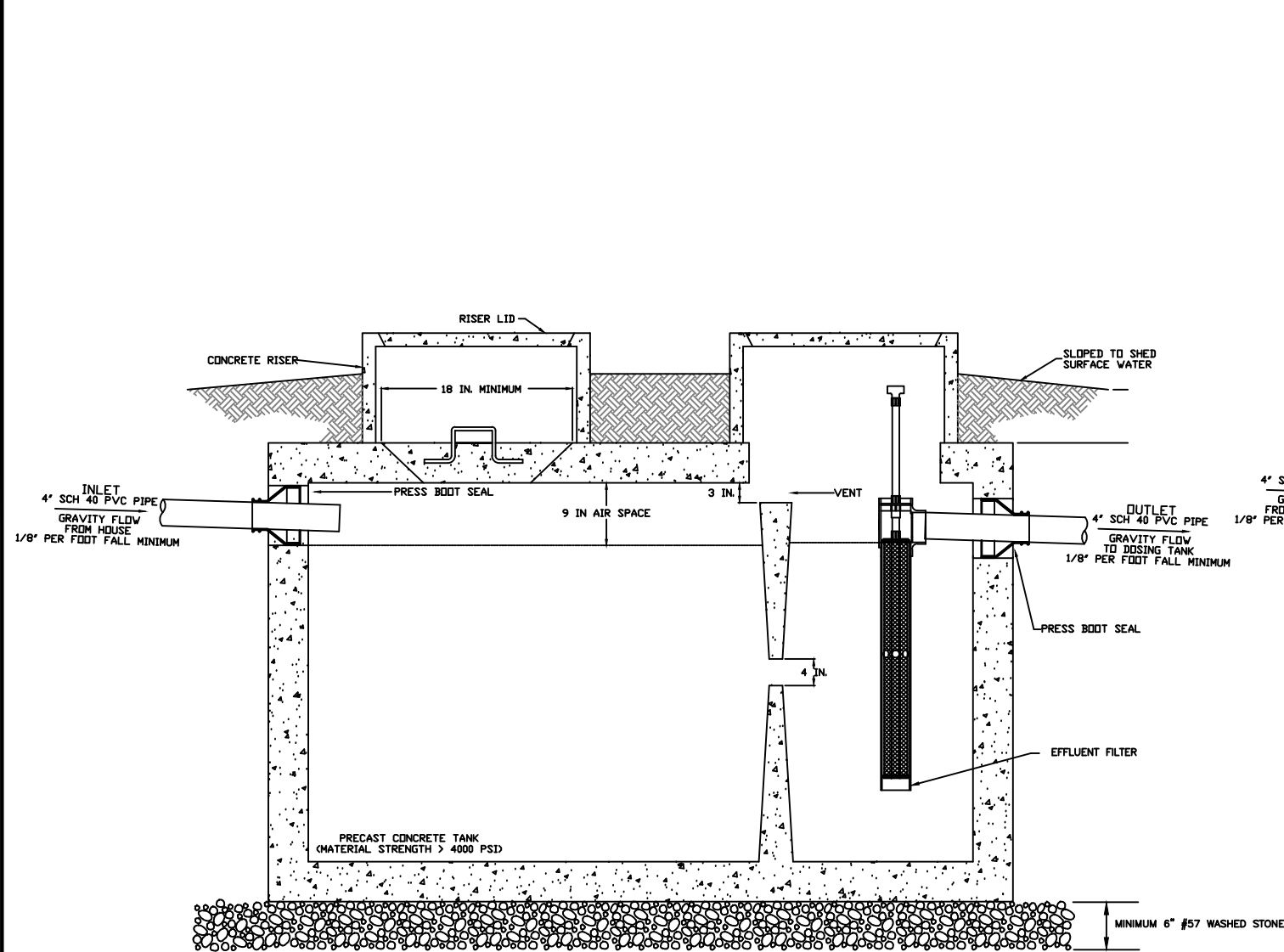
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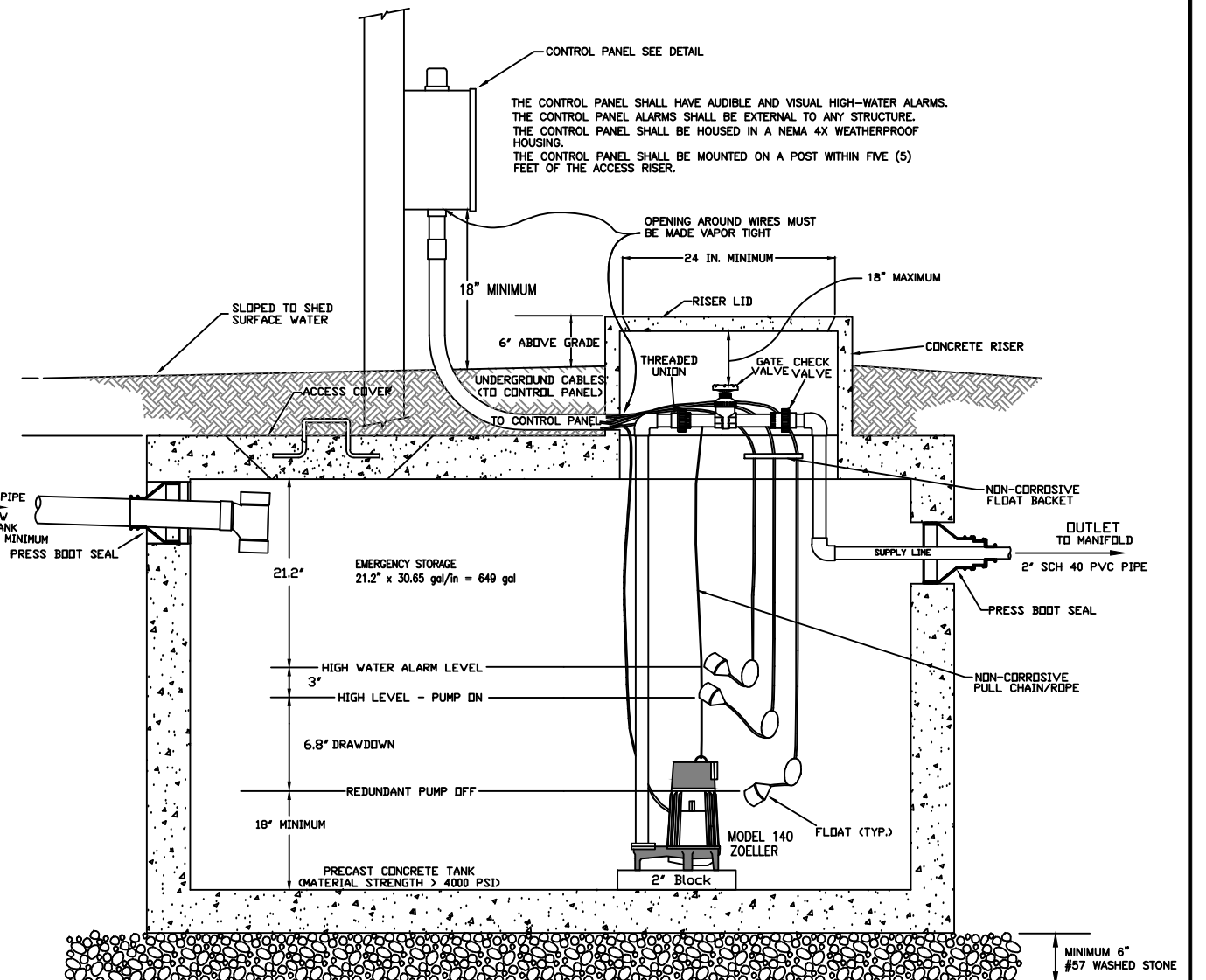
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Manufacturers of . . .

"QUALITY PUMPS SINCE 1939"



1500 GAL BRANTLEY SEPTIC TANK SCHEMATIC
NOT TO SCALE



1500 GAL BRANTLEY PUMP TANK SCHEMATIC
NOT TO SCALE

NOTES

1. ALL TANKS SHALL BE LEAK TESTED SUCH THAT EXFILTRATION OCCURS AT A RATE WHICH DOES NOT EXCEED TEN GALLONS PER TWENTY-FOUR HOURS PER 1,000 GALLONS OF TANK CAPACITY
2. ALL TANKS SHALL REST ON A BED OF #57 WASHED GRAVEL. THE MINIMUM THICKNESS OF THE GRAVEL BED IS 6 INCHES.
3. ALL TANKS MUST BE APPROVED FOR USE BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL HEALTH (DEH).
4. INVERTS SHOWN ARE APPROXIMATE. THE INSTALLER SHALL FIELD CONFIRM PRIOR TO CONSTRUCTION.
5. ALL HARDWARE INSTALLED INSIDE OF TANKS SHALL BE OF STAINLESS STEEL.
6. TANK DIMENSIONS VARY BY MANUFACTURER.
7. DRAWDOWN WILL VARY WITH TANK DIMENSIONS. DRAWDOWN SHOWN IS BASED ON 480 GALLONS AT 30.65 GALLONS PER INCH.
8. NO ELECTRICAL SPLICES SHALL BE MADE INSIDE THE PUMP TANK.

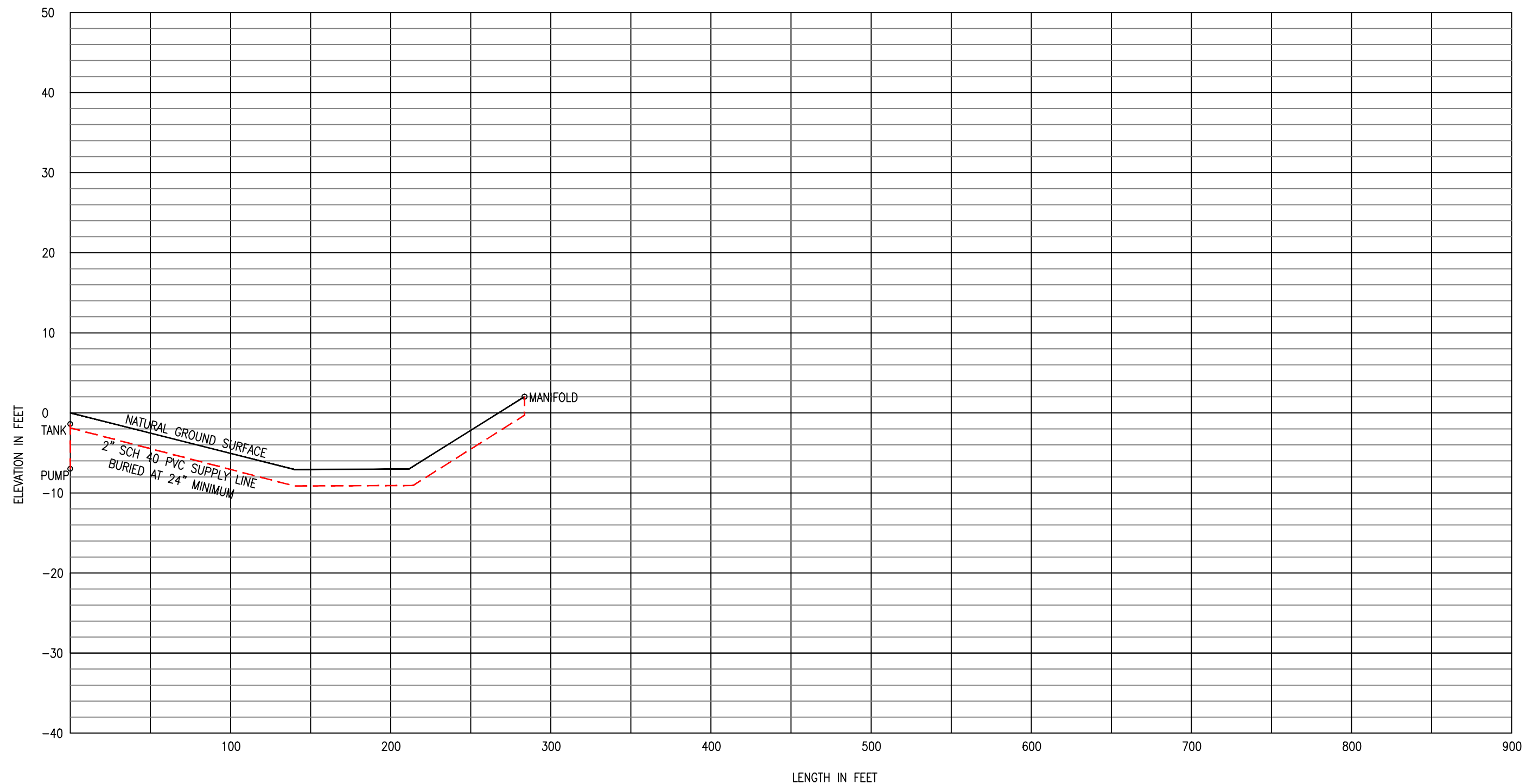


Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
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Phone (919)569-6704 Fax (919)569-6703

Septic and Pump Tank Details
Alpine Creek Lot 18
Raleigh, Wake County, North Carolina

Job# : 2988
Drawn By : TMB
Date : 11/07/2019
Revision : 12/02/2019

SUPPLY LINE
HYDRAULIC PROFILE



NOTES:

1. ELEVATIONS TAKEN FROM WAKE COUNTY GIS

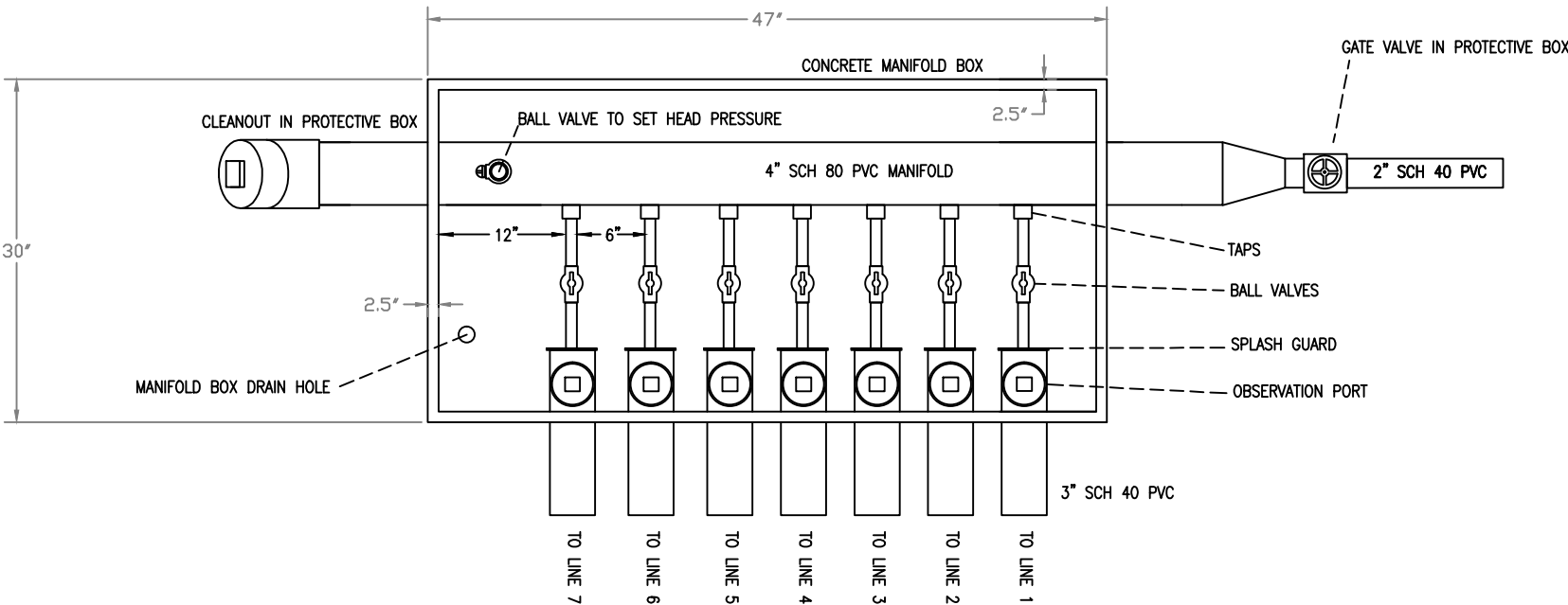


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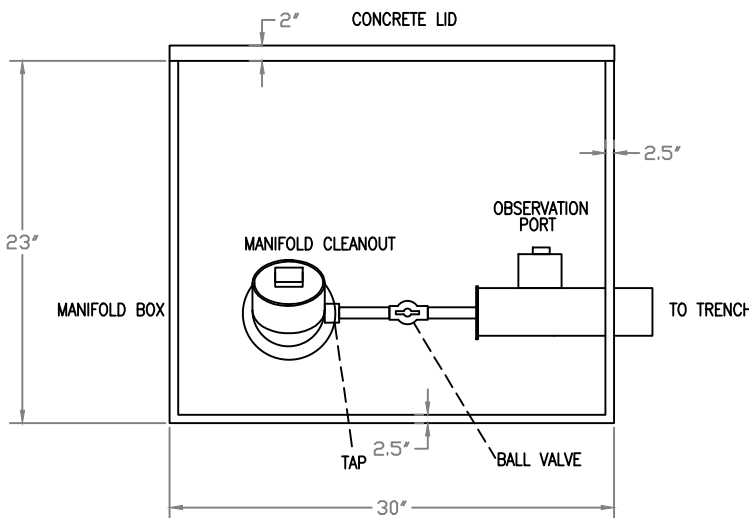
Hydraulic Profile
Alpine Creek Lot 18
Raleigh, Wake County, North Carolina

Job# : 2988
Drawn By : TMB
Date : 11/07/2019
Revision : 00/00/0000

PRESSURE MANIFOLD DETAILS TOP VIEW

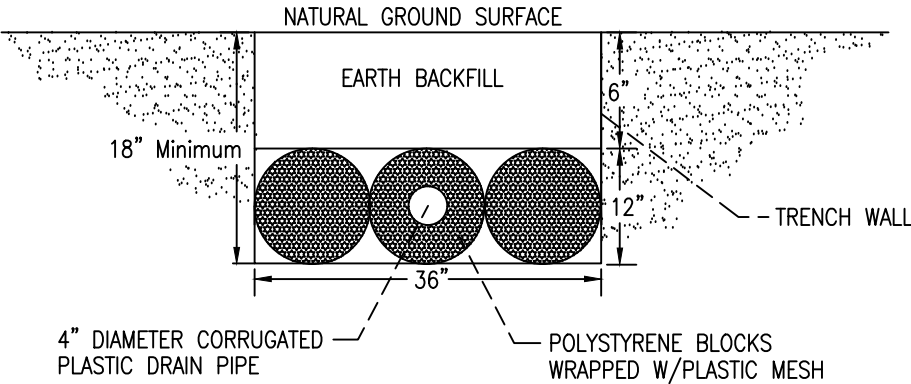


PRESSURE MANIFOLD DETAILS END VIEW



TAP SCHEDULE	
LINE #	TAP
1	$\frac{1}{2}$ " SCH 40
2	$\frac{1}{2}$ " SCH 40
3	$\frac{1}{2}$ " SCH 80
4	$\frac{1}{2}$ " SCH 80
5	$\frac{1}{2}$ " SCH 80
6	$\frac{1}{2}$ " SCH 80
7	$\frac{1}{2}$ " SCH 40

EZ-FLOW DETAILS



NOTE :

1. EZ-FLOW INSTALLATION SHALL MEET THE REQUIREMENTS INCLUDED IN ITS INNOVATIVE APPROVAL
2. TRENCH BOTTOM SHALL BE AT LEAST 12" FROM ANY RESTRICTIVE SOIL LAYER
3. END CAP SHALL BE PROVIDED AT END OF ALL CORRUGATED PLASTIC PIPE LINES AND TRENCH BOTTOMS SHALL BE LEVEL
4. THIS IS A GENERIC TRENCH PROFILE SEE COUNTY PERMIT FOR TRENCH DEPTH.



Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, North Carolina 27587
Phone (919)569-6704 Fax (919)569-6703

Manifold and Trench Details
Alpine Creek Lot 18
Raleigh, Wake County, North Carolina

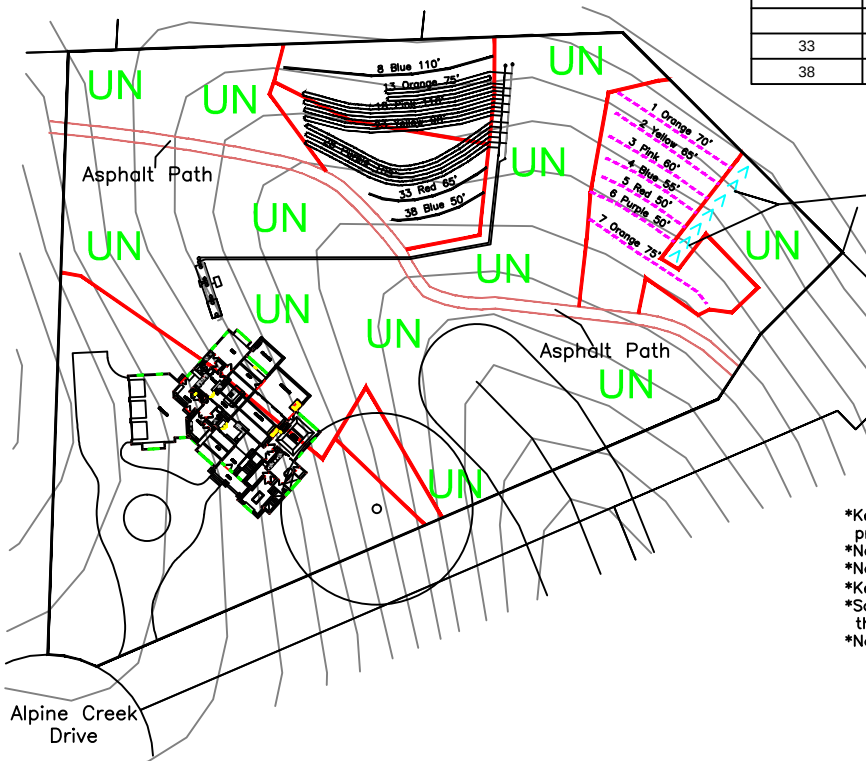
Job# : 2988
Drawn By : TMB
Date : 11/07/2019
Revision : 00/00/0000

System: Pressure Manifold
 Lines: 1-7, (425')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom

Repair: Subsurface Drip
 Lines: 8-38, (>1,600')
 Accepted Status System
 0.15 Soil LTAR
 12" Trench Bottom

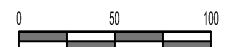
LINE SCHEDULE REPAIR

LINE NUMBER	COLOR	FIELD ELEVATION	LENGTH	DESIGN LENGTH
1	ORANGE	3.1	70	
2	YELLOW	4.5	65	
3	PINK	5.8	60	
4	BLUE	6.9	55	
5	RED	7.8	50	
6	PURPLE	8.9	50	
7	ORANGE	10.2	75	
8	BLUE	3.1	110	
			103	
			96	
			89	
			82	
13	ORANGE	4.4	75	
			83	
			91	(1) 200
			99	
			107	(2) 200
18	PINK	5.6	116	
			113	(3) 200
			109	
			106	(4) 200
			102	
23	YELLOW	6.6	98	(5) 200
			99	
			101	(6) 200
			102	
			103	(7) 200
28	PURPLE	7.7	105	
			100	(8) 200
			90	
			80	
			70	
33	RED	7.7	65	
38	BLUE	10.8	50	



Drain to be filled and properly compacted.

- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.



SCALE:
 1" = 100 ft.



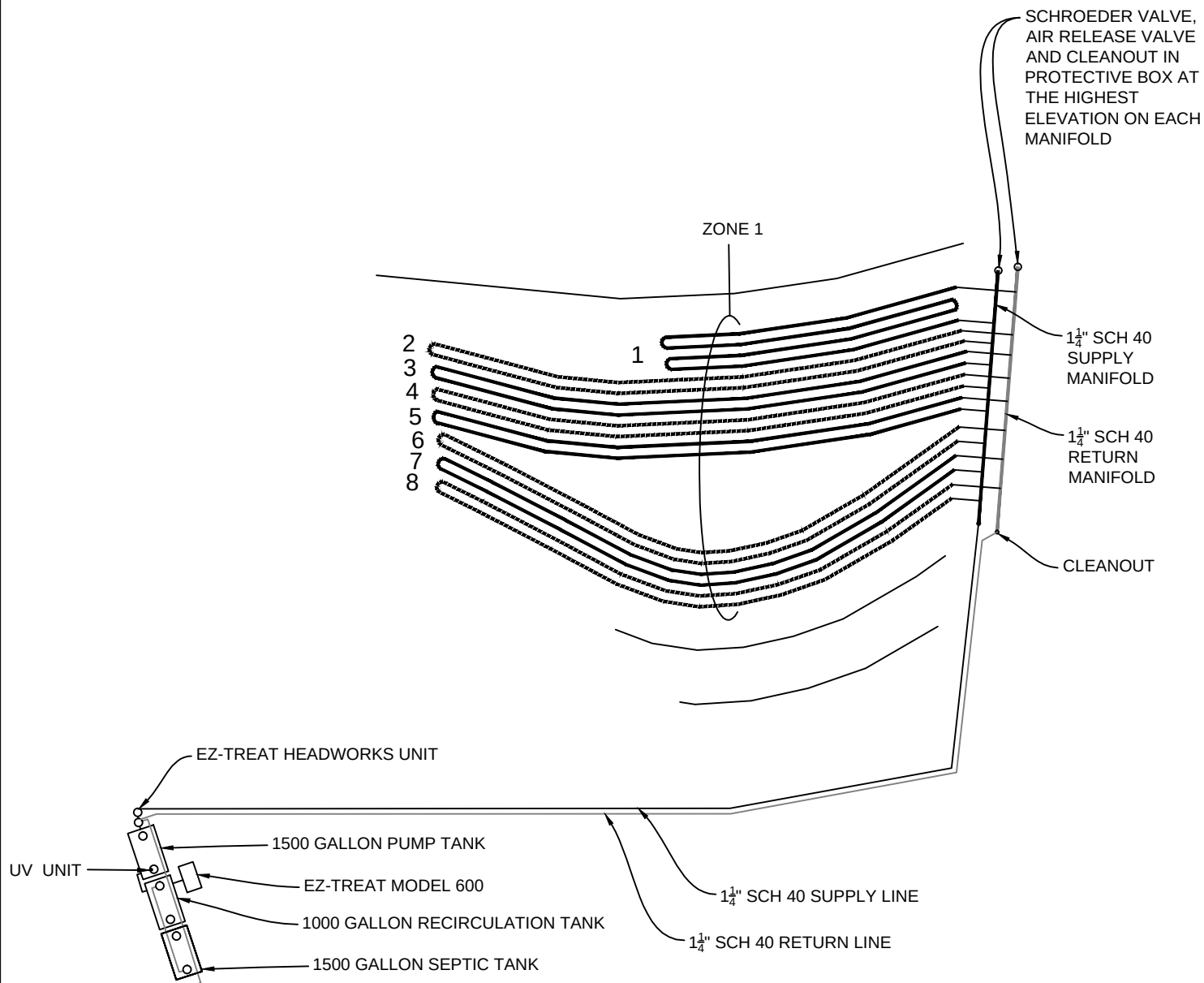
Central Carolina Soil Consulting, PLLC
 1900 South Main Street, Suite 110
 Wake Forest, North Carolina 27587
 Phone (919)569-6704 Fax (919)569-6703

Septic System Layout
 (REPAIR)
 Alpine Creek Lot 18
 Wake County North Carolina

Job# : 2988
 Drawn By : TMB
 Date : 11/05/2019
 Revision: 00/00/0000

DRIP SYSTEM DETAIL

(NOT TO SCALE)



Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, North Carolina 27587
Phone (919)569-6704 Fax (919)569-6703

DRIP SYSTEM DETAIL
Alpine Creek Lot 18
Wake County, North Carolina

Job# : 2988
Drawn By : TMB
Date : 11/05/2019
Revision: 11/21/2019

E-Z Set Drip Field Calculations

Job Description:	Alpine Creek Lot 18
Contact:	Richard Tilley
Prepared by:	Matt Burdette
Date:	7-Nov-19

Please fill in the shaded areas and drop down menus:

This spreadsheet serves as a guide, and is not a complete hydraulic design.

Worksheet 1- Field Flow

Total field

Total Quantity of effluent to be disposed per day	480	gallons / day
Hydraulic loading rate	0.15	gallons / sq.ft. / day
Total Dispersal Field Area	3,200	square ft.

Flow per zone

Number of Zones	1	zone(s)
Dispersal area per zone	3,200	square ft.
Choose line spacing between drip lines	2	ft.
Choose emitter spacing between drip emitters	2	ft.
Total linear ft. per zone (minimum required)	1,600	ft. per zone
Total number of emitters per zone	800	emitters per zone
Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
Pressure at the beginning of the dripline	30	psi
Feet of Head at the beginning of the dripline	69.3	ft.
What is the flow rate per emitter in gph?	0.53	gph
Dose flow per zone	7.07	gpm

Note: A few States or Counties require additional flow for flushing. Please check your local regulations.

Flush velocity in this spreadsheet below is for PC dripline only. Classic dripline usually requires less flow to flush than PC.

Please refer to Geoflow's spreadsheet called "Design Flow and Flush Curves" at www.geoflow.com or call 800-828-3388.

If required, choose flush velocity	1.2	ft/sec
How many lines of dripline per zone?	8	lines
Fill in the actual length of longest dripline lateral	200	ft.
Max. allowable length of a single drip line	535	ft.
Flush flow required at the end of each dripline	0.89	gpm
Total Flow required to achieve flushing velocity	7.10	gpm
Total Flow per zone- worst case scenario	14.17	gpm

Select Filters and zone valves

Select pipe diameters for manifolds and submains	1.25	inch
Select Filter Type	Vortex Screen Filter	
Recommended Filter (item no.)	AP4E-1.5	
Select Zone Valve Type	None	-
Recommended Zone Valve (item no.)	0	

Check below to choose quantity and length of daily doses

Dosing

Number of doses per day / zone:	12	doses
Timer ON. Pump run time per dose/zone:	5.40	mins:secs
Timer OFF. Pump off time between doses	1.54	hrs:mins
Per Zone - Pump run time per day/zone:	1:07	hrs:mins
All Zones - Number of doses per day / all zones	12	doses / day
All Zones - Pump run time per day/ all zones:	1:07	hrs:mins

E-Z Set Drip Pump Calculations

Job Description:	Alpine Creek Lot 18
Contact:	Richard Tilley
Prepared by:	Matt Burdette
Date:	11/7/2019

Please fill in the shaded areas and drop down menus:

This spreadsheet serves as a guide, and is not a complete hydraulic design.

Pressure losses may be grossly overstated, particularly if designing with Non PC dripline.

The letters on the diagram(right) match the letters in section 2 below.

Worksheet - Pump Sizing

Section 1 - Summary from Worksheet 1

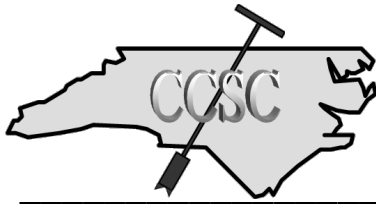
Flow required to dose field	7.07 gpm
Flow required to flush field	7.10 gpm
Flow required to dose & flush field	14.17 gpm
Filter	AP4E-1.5
No. of Zones	1 zones
Zone valve	-
Dripline	Wasteflow PC - 1/2gph
Dripline longest lateral	200 ft.

Section 2	Ft of head	Pressure
A. Flush line - Losses from end of dripfield to tank		
Return header pipe size	1.25 inch	
Pressure loss in 100 ft. of pipe	3.07 ft.	1.33 psi
Distance from furthest dripline end back to tank	250 ft.	
Equivalent length of fittings	25 ft.	57.75
Elevation increase or decrease	-2 ft.	
Total pressure loss from end of dripline to return tank	6.4 ft.	2.79 psi
B. Dripline - Losses through Wasteflow dripline		
Fill in the length of longest dripline lateral	200 ft.	
Minimum pressure required at end of dripline	23.10 ft.	10.00 psi
Loss through dripline during flushing	2.59 ft.	1.12 psi
Total minimum required dripline pressure	25.69 ft.	11.12 psi
A+B. Minimum Pressure required at beginning of dripfield		
CALCULATED pressure required at beginning of dripfield	32.14 ft.	13.91 psi
SPECIFIED pressure at beginning of dripfield (from worksht 1)	69.3 ft.	30.00 psi
Great! SPECIFIED Pressure is greater than CALCULATED Pressure requirement. Go to next step		
C. Drip components - Losses through components		
Filter	4.6 ft.	2.00 psi
Zone valve (not in diagram)	- ft.	- psi
Flow meter (not in diagram)	4.6 ft.	2.00 psi
Other	- ft.	psi
Total loss through drip components	9.2 ft.	4.00 psi
D. Supply line - Minimum Pressure head required to get from pump tank to top of dripfield		
Supply Header Pipe Size from Worksheet 1	1.25 inch	
Pressure loss/gain in 100 ft. of pipe	3.07 ft.	1.33 psi
Distance from pump to furthest dripline	280 ft.	
Equivalent length of fittings	25 ft.	psi
Height from pump to tank outlet	5 ft.	psi
Elevation increase or decrease	2 ft.	0.87 psi
Total gain or loss from pump to field	16.4 ft.	7.09 psi
Total dynamic head	94.9 ft.	41.09 psi
Pump capacity *	14.2 gpm	

* Note: Pump capacity flow assumes flow in dripline does not change during a dose cycle. With Non PC drip For more accurate flows please contact E-Z Set.

If you need assistance designing for this additional flow, please

-Contact E-Z Set @ 703-408-2916



Central Carolina Soil Consulting, PLLC
1900 South Main Street, Suite 110
Wake Forest, NC 27587
919-569-6704/fax 919-569-6703

CA PART - E

November 6, 2019

Wake County Staff
Wake County Environmental Health Department
336 Fayetteville Street
Raleigh, North Carolina 27601



**Department of Environmental Services
Wake County**

Approved by

Shawna Denton

Date : 11/27/2019

Review of this document has been made only for conformance with the design concept of the project and approval shall not relieve the designer and/or contractor from responsibility for any errors therein or for furnishing the materials, and equipment of proper dimension, size, quantity, quality and all performance characteristic to meet the requirements and intent of the contract documents.

RE: Wastewater Daily Flow Calculations
Alpine Creek Lot 18
1421 Alpine Creek Drive 182, Raleigh, Wake County, North Carolina
Project #2988

Dear Wake County Staff:

Central Carolina Soil Consulting (CCSC) in conjunction with Bateman Civil Survey Company are proposing wastewater daily flow calculations for a single-family home located at Judd Reserve Lot 42 pursuant to session law 2014-120 and 2013-413. The proposed home will have **5** bedrooms and under the current flow calculations provided in the state rules would have a daily flow of **600** gallons per day. That would be based on 120 gallons per bedroom.

Household flow rates from the 15 NCAC 18A section of the state rules relied on fixture flow rates from 1982, and calculated the flows for common fixtures to established average flows for the purpose of calculating household daily flows and septic system based on those flows. The data for the historic fixture flows was taken from the EPA 2002 Onsite Wastewater Treatment Systems Manual.

The attached spreadsheet contains the flow reducing fixtures that Tall Traditions Homes includes in their homes today. The table includes flow rates for the flow reducing fixtures as well as flow rates from the state rules and the percentage of water savings. On average the proposed fixtures provide a 39% savings.

We are requesting a reduction of 20% for the use of low flow fixtures. This will provide an adjusted daily flow of 96 gallons per bedroom per day and a total flow of **480** gallons per day for the proposed 4-bedroom house.

Should you have any questions or comments please contact Matt Burdette at 919-422-2827.

Sincerely,

CENTRAL CAROLINA SOIL CONSULTING PLLC

BATEMAN CIVIL SURVEY COMPANY



Matt Burdette
Environmental Specialist



Tom Spieght, P.E.
(seal)



Attachments

Alpine Creek Lot 18						
	Item		Gal/min. or flush	Number of Fixures	Base Flow From 1982	Percent Water Savings
Laundry Room	Laundry Faucet	Moen 67315C	1.5 gal/minute	1	3.0 gal/minute	50%
Wet Bars	Wet Bar Faucet	Moen 5985	1.5 gal/minute	3	3.0 gal/minute	50%
Master	Shower	Moen T2283EP	2 gal/minute	1	5.5 gal/minute	63%
	Lavatory Faucet	Moen T6805	1.2 gal/minute	2	3.0 gal/minute	60%
	Tub Trim	Moen T683	Fill & Release	1	Fill & Release	50%
Kitchen/Scullery	Kitchen Sink Faucet	Moen 7185	1.5 gal/minute	2	3.0 gal/minute	50%
	Dishwasher	Bosch 800 Series		2	10.0 gal/load	0%
Bath 2	Lavatory Faucet	Moen T6805	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower	Moen T2283EP	2 gal/minute	1	5.5 gal/minute	63%
Bath 3	Lavatory Faucet	Moen T6805	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower	Moen T2283EP	2 gal/minute	1	5.5 gal/minute	63%
Bath 4	Lavatory Faucet	Moen T6805	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower/Tub	Moen T2283EP	2 gal/minute	1	5.5 gal/minute	63%
Guest Room	Lavatory Faucet	Moen T6805	1.2 gal/minute	1	3.0 gal/minute	60%
	Shower	Moen T2283EP	2 gal/minute	1	5.5 gal/minute	63%
1/2 Baths	Lavatory Faucet	Moen T6805	1.2 gal/minute	2	3.0 gal/minute	60%
Toilets	Master, Powder, 3, 4, 5	Gerber VP-21-518	1.6 gal /flush	5	3.5 gal/minute	54%

* Energy star requires a 3.5 gallons/load or less for there certification on dishwashers (see page 1 attached EPA Watersense document).

FIXTURES	TOILET	FAUCET	SHOWER	CLOTHES WASHER	LEAK	BATH	OTHER	DISHWASHER	TOTALS
PERCENT OF HOUSE HOLD WATER USE	24%	20%	20%	16%	12%	3%	3%	2%	100%
GALLONS PER DAY (600 BASE)	144	120	120	96	72	18	18	12	600
PERCENT OF SAVINGS FROM WATER SAVING FIXURES	63%	56% avg	63%	0%	0%	0%	0%	0%	39%
ADJUSTED FLOW (GALLONS)	53	53	44	96	72	18	18	12	366



Buy it for looks. Buy it for life.®

Specifications

DESCRIPTION

- Metal construction with various finishes identified by suffix
- Hot and cold temperature indicators available

OPERATION

- Lever style handles with optional hot and cold indicators available
- Rotate hot side handle counterclockwise to open (clockwise to close) and the cold side handle clockwise to open and (counterclockwise to close)

FLOW

- Water usage is limited to these maximum flow rates as indicated by the corresponding product markings
 - 1.2 gpm max (4.5L/min) at 60 psi

CARTRIDGE

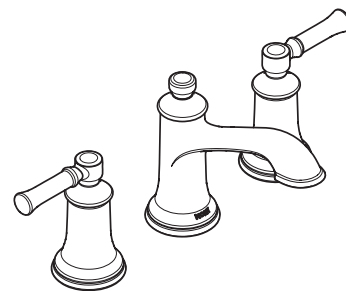
- 1234™ Duralast™ cartridge
- Nonmetallic, nonferrous and stainless steel material

STANDARDS

- Third party certified to meet ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein
- ADA  for lever handles

WARRANTY

- Limited lifetime warranty against leaks, drips and finish defects to the original consumer purchaser
- 5 year warranty if used in commercial installations



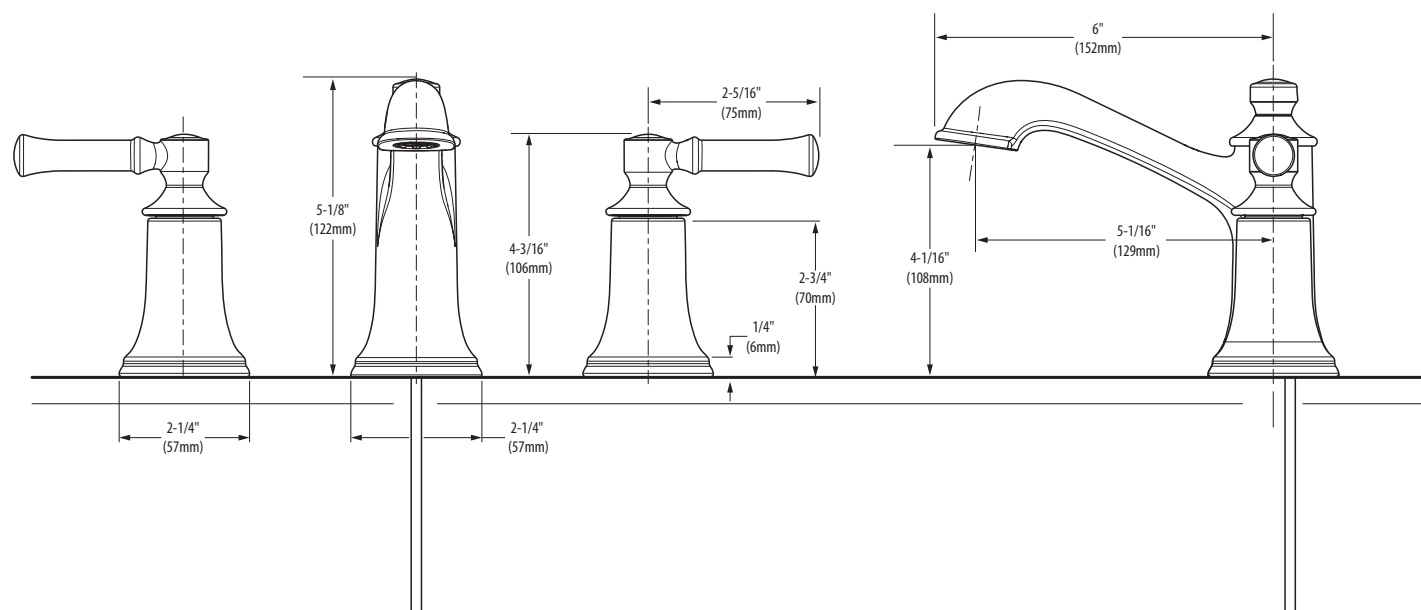
DARTMOOR™ Two Handle Widespread Lavatory Faucet Trim

Models: T6805 series

Valve: 9000, 69000

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED THRU 3 HOLES, 1-1/8" MIN. DIA.

NOTE: FOR DECK THICKNESS 1-1/2" to 3", USE SERVICE KIT #175709. VALVES INSTALL THROUGH 1-1/4" DIA. HOLE.



CRITICAL DIMENSIONS

(DO NOT SCALE)



Buy it for looks. Buy it for life.®

Specifications

DESCRIPTION

- Metal construction with various finishes identified by suffix
- Includes showerhead, arm, flange and diverter spout

OPERATION

- Handle operates counterclockwise through a 270° arc with off at 6 o'clock and maximum hot at the 9 o'clock position. Shut off in clockwise direction
- Adjustable temperature limit stop to control maximum hot water temperature
- Pressure balancing mechanism maintains selected discharge temperature to $\pm 3^\circ$

FLOW

- EP suffix models are limited to 2.0 gpm (7.6 L/min) at 80 psi

CARTRIDGE

- 1222 cartridge design
- Nonmetallic/nonferrous and stainless steel materials
- Accommodates back to back installations

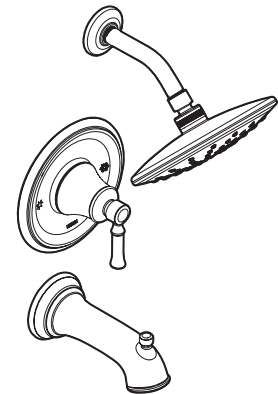
STANDARDS

- Third party certified to meet ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein
- EP suffix models are third party certified to WaterSense®

- **ADA**  for lever handle

WARRANTY

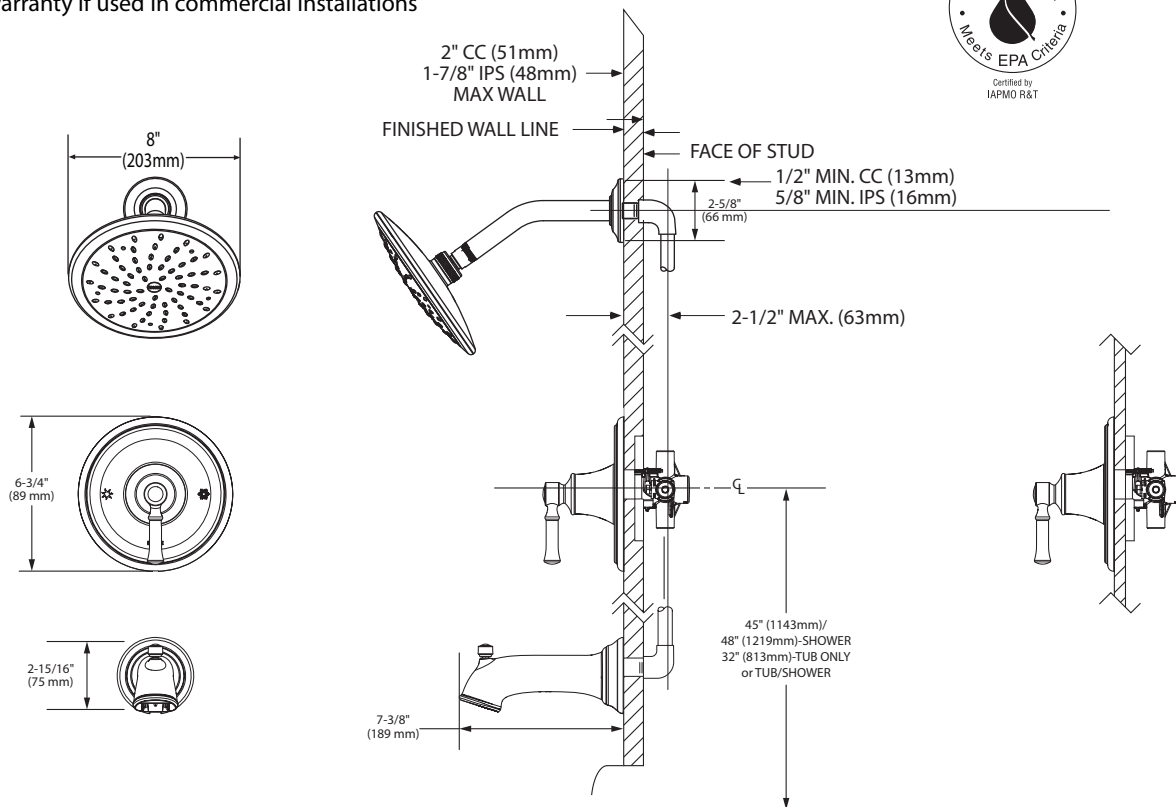
- Lifetime limited warranty against leaks, drips and finish defects to the original consumer purchaser
- 5 year warranty if used in commercial installations



DARTMOOR™ POSI-TEMP® Single-Handle Tub/Shower Trim Kit with Rainshower

Models: T2282EP series - shower trim only
T2283EP series - tub/shower trim

Valves: 62300 series
2500 series



CRITICAL DIMENSIONS

(DO NOT SCALE)

FOR MORE INFORMATION CALL: 1-800-BUY-MOEN

www.moen.com



Buy it for looks. Buy it for life.®

*There is more than 1 version of this model.
Page down to identify the version you have.*

FAUCET DESCRIPTION

- Reflex™ pulldown system offers smooth operation, easy movement and secure docking
- Power Clean™ spray technology
- Metal construction with various finishes identified by suffix
- Duralock™ quick connect installation
- Pullout spray with 68" braided hose
- Flexible supply lines with 3/8" compression fittings
- High arc spout provides the perfect height and reach for prep sinks while the pulldown feature provides infinite maneuverability for food preparation tasks
- 360° rotating spout

OPERATION

- Lever style handle
- Temperature controlled by 100° arc of handle travel
- Operates with less than 5 lbs. of force
- Operates in stream or spray mode in the pullout or retracted position

FLOW

- Flow is limited to 1.5 gpm (5.7 L/min) at 60 psi

CARTRIDGE

- 1255™ Duralast™ cartridge for Single-Handle Faucets

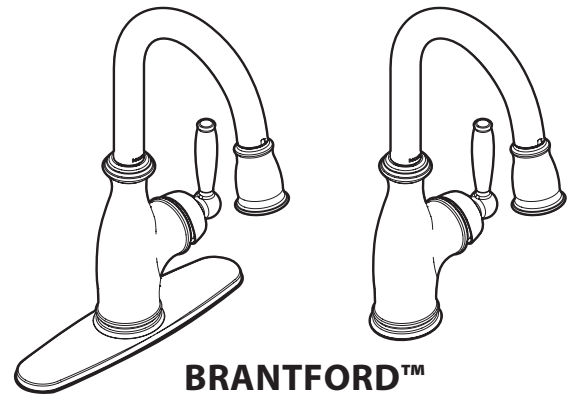
STANDARDS

- Third party certified to IAPMO Green, ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein including NSF 61/9
- Meets CalGreen and Georgia SB370 requirements
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- The backflow protection system in the device consists of two independently operating check valves, a primary and a secondary which prevent backflow
- **ADA**  for lever handle

WARRANTY

- Lifetime limited warranty against leaks, drips and finish defects to the original homeowner
 - 10 year limited warranty when used in a multifamily installation
 - 5 year limited warranty when used in a commercial installation
- Visit www.moen.com/support for complete details and limitations

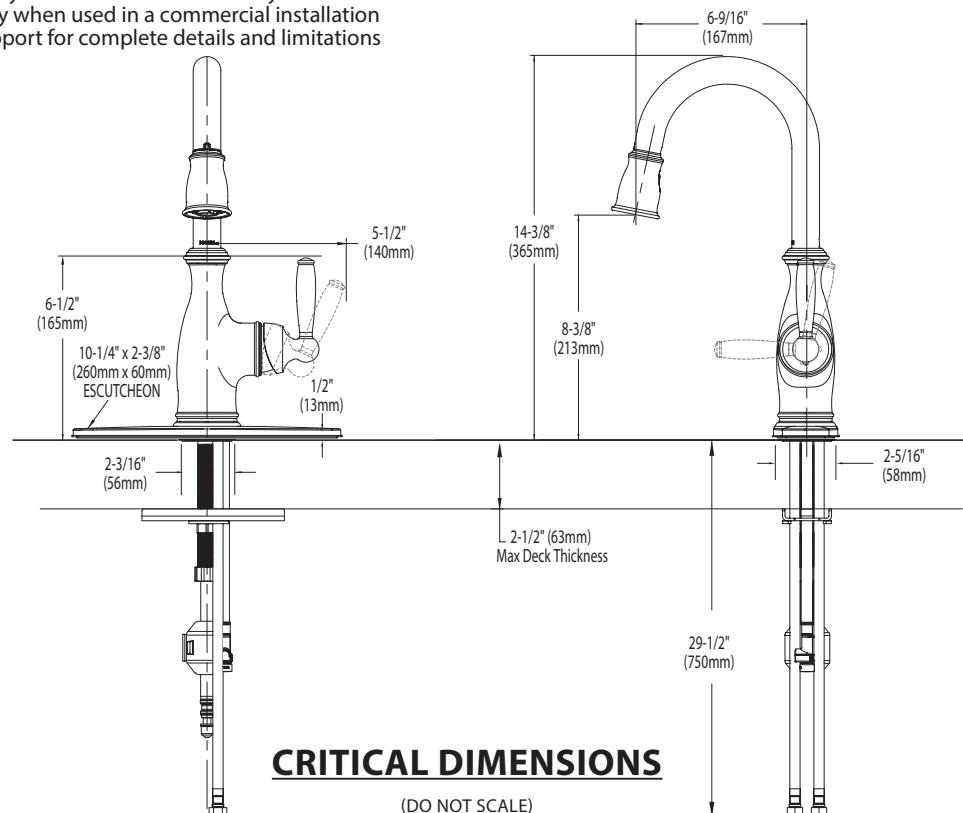
Specifications



BRANTFORD™
Single Handle High Arc
Pulldown Prep/Bar Faucet

Models: 5985 series

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED
THRU 1 OR 3 HOLES, 1-1/2" (38mm) MIN. DIA.



CRITICAL DIMENSIONS

(DO NOT SCALE)

FAUCET DESCRIPTION

- Reflex™ pulldown system offers smooth operation, easy movement and secure docking
- Metal construction with various finishes identified by suffix
- Quick connect installation
- Pullout spray with 68" braided hose
- Flexible supply lines with 3/8" compression fittings
- High arc spout provides the perfect height and reach for prep sinks while the pulldown feature provides infinite maneuverability for food preparation tasks
- 360° rotating spout

OPERATION

- Lever style handle
- Temperature controlled by 100° arc of handle travel
- Operates with less than 5 lbs. of force
- Operates in stream or spray mode in the pullout or retracted position

FLOW

- Flow is limited to 1.5 gpm (5.7 L/min) at 60 psi

CARTRIDGE

- 1255™ Duralast™ cartridge for Single-Handle Faucets

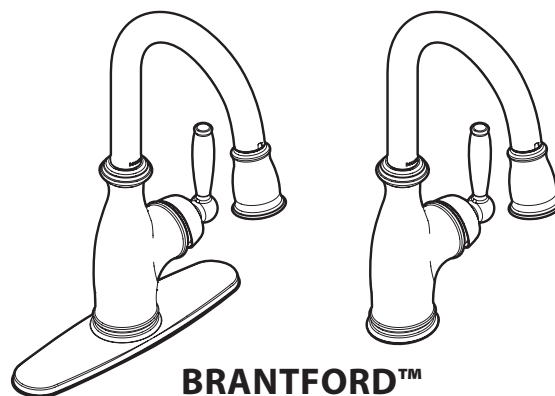
STANDARDS

- Third party certified to IAPMO Green, ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein including NSF 61/9
- Meets CalGreen and Georgia SB370 requirements
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- The backflow protection system in the device consists of two independently operating check valves, a primary and a secondary which prevent backflow

- **ADA**  for lever handle

WARRANTY

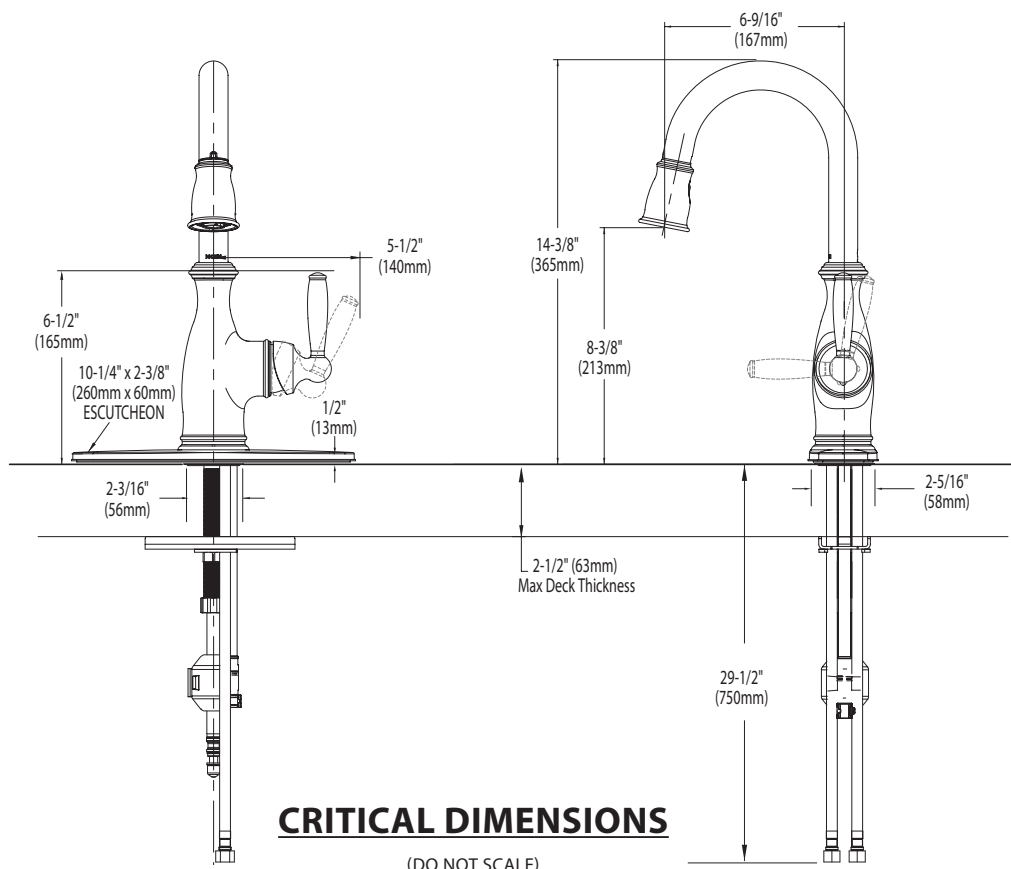
- Lifetime limited warranty against leaks, drips and finish defects to the original consumer purchaser
- 5 year warranty if used in commercial installations



BRANTFORD™
Single Handle High Arc
Pulldown Prep/Bar Faucet

Models: 5985 series

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED
THRU 1 OR 3 HOLES, 1-1/2" (38mm) MIN. DIA.





Buy it for looks. Buy it for life.®

*There is more than 1 version of this model.
Page down to identify the version you have.*

FAUCET DESCRIPTION

- Reflex™ pulldown system offers smooth operation, easy movement and secure docking
- Metal construction with various finishes identified by suffix
- Duralock™ quick connect system
- Pullout spray with 68" braided hose
- Flexible supply lines with 3/8" compression fittings
- High arc spout provides height and reach to fill or clean large pots while pull out wand provides the maneuverability for cleaning or rinsing
- 360° rotating spout

OPERATION

- Lever style handle
- Temperature controlled by 100° arc of handle travel
- Operates with less than 5 lbs. of force
- Operates in stream or spray mode in the pullout or retracted position
- When filling a vessel outside the sink, the pause feature conveniently stops the flow of water as the wand passes over the counter top

FLOW

- Flow is limited to 1.5 gpm (5.7 L/min) at 60 psi

CARTRIDGE

- 1255™ Duralast™ cartridge for Single-Handle Faucets

STANDARDS

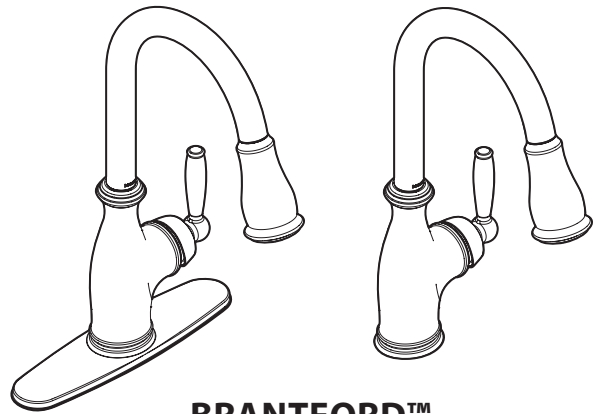
- Third party certified to IAPMO Green, ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein
- Certified to ANSI/NSF 61/9 & 372
- Meets CalGreen and Georgia SB370 requirements
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- The backflow protection system in the device consists of two independently operating check valves, a primary and a secondary which prevent backflow

- ADA  for lever handle

WARRANTY

- Lifetime limited warranty against leaks, drips and finish defects to the original homeowner
 - 10 year limited warranty when used in a multifamily installation
 - 5 year limited warranty when used in a commercial installation
- Visit www.moen.com/support for complete details and limitations

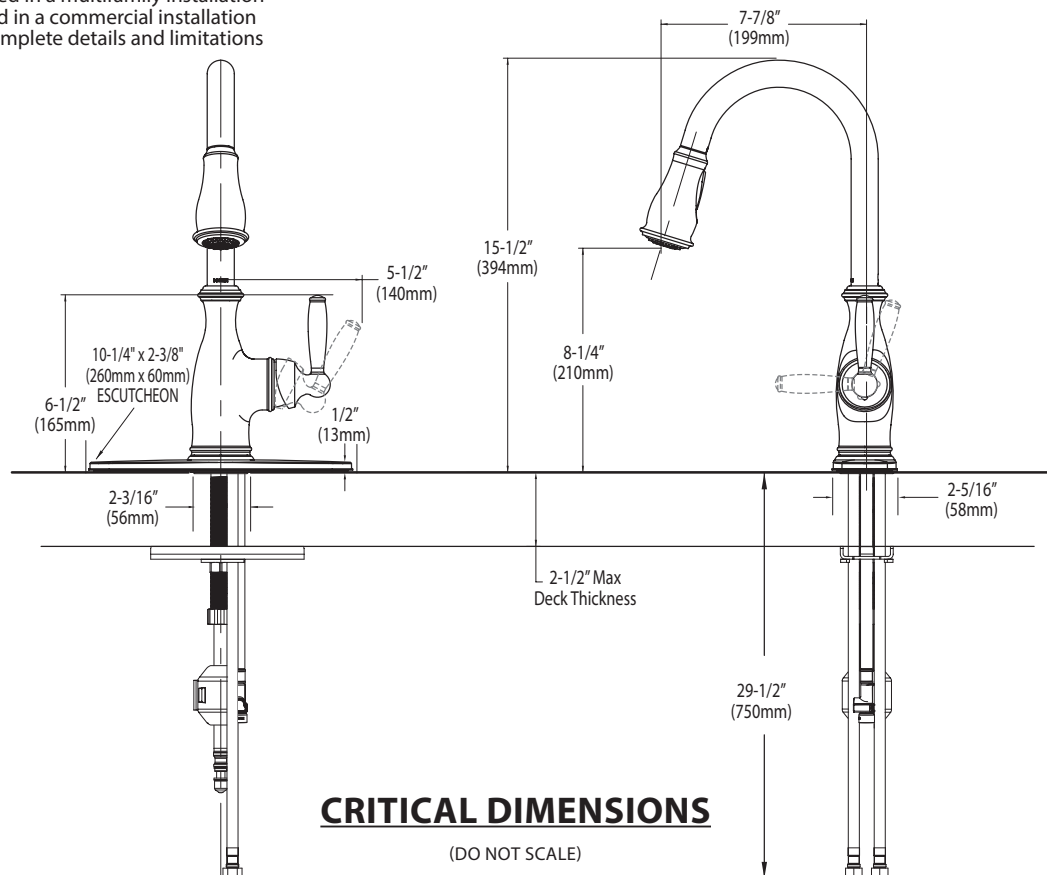
Specifications



BRANTFORD™
Single Handle High Arc
Pulldown Kitchen Faucet

Models: 7185 series

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED
THRU 1 OR 3 HOLES, 1-1/2" (38mm) MIN. DIA.





Buy it for looks. Buy it for life.®

FAUCET DESCRIPTION

- Reflex™ pulldown system offers smooth operation, easy movement and secure docking
- Metal construction with various finishes identified by suffix
- Quick connect installation
- Pullout spray with 68" braided hose
- Flexible supply lines with 3/8" compression fittings
- High arc spout provides height and reach to fill or clean large pots while pull out wand provides the maneuverability for cleaning or rinsing
- 360° rotating spout

OPERATION

- Lever style handle
- Temperature controlled by 100° arc of handle travel
- Operates with less than 5 lbs. of force
- Operates in stream or spray mode in the pullout or retracted position
- When filling a vessel outside the sink, the pause feature conveniently stops the flow of water as the wand passes over the counter top

FLOW

- Flow is limited to 1.5 gpm (5.7 L/min) at 60 psi

CARTRIDGE

- 1255™ Duralast™ cartridge for Single-Handle Faucets

STANDARDS

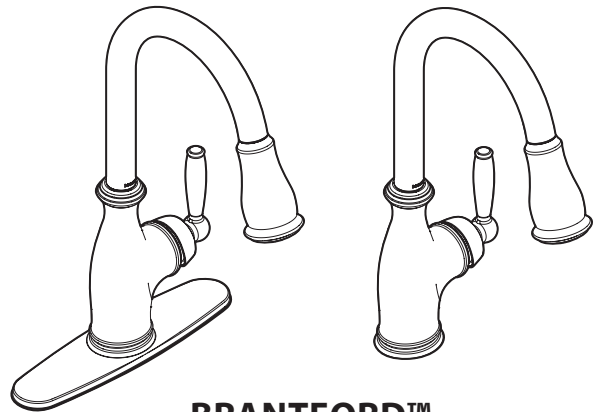
- Third party certified to IAPMO Green, ASME A112.18.1/CSA B125.1 and all applicable requirements referenced therein
- Certified to ANSI/NSF 61/9 & 372
- Meets CalGreen and Georgia SB370 requirements
- Complies with California Proposition 65 and with the Federal Safe Drinking Water Act
- The backflow protection system in the device consists of two independently operating check valves, a primary and a secondary which prevent backflow

- **ADA**  for lever handle

WARRANTY

- Lifetime limited warranty against leaks, drips and finish defects to the original homeowner
 - 10 year limited warranty when used in a multifamily installation
 - 5 year limited warranty when used in a commercial installation
- Visit www.moen.com/support for complete details and limitations

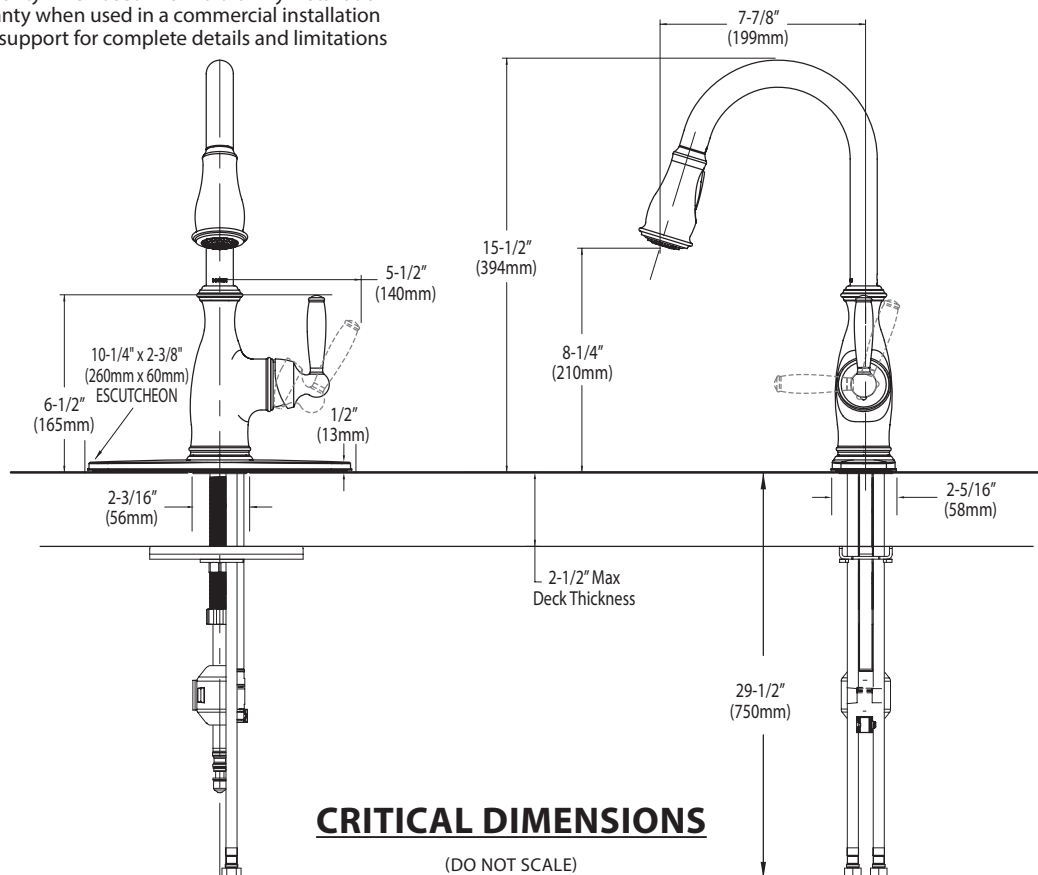
Specifications



BRANTFORD™
Single Handle High Arc
Pulldown Kitchen Faucet

Models: 7185 series

NOTE: THIS FAUCET IS DESIGNED TO BE INSTALLED
THRU 1 OR 3 HOLES, 1-1/2" (38mm) MIN. DIA.



CRITICAL DIMENSIONS

(DO NOT SCALE)

TO ORDER PARTS CALL: 1-800-BUY-MOEN
www.moen.com



GERBER

www.gerberonline.com

Viper™ 1.6 GPF ErgoHeight™ ADA Elongated Toilet

12" Rough-in

Features:

VP-21-518

- Vitreous china
- Combination bowl and tank
- 3" flush valve with Fluidmaster® fill valve for quiet fill
- 12" rough-in
- Elongated bowl
- Dual-fed siphon jet action bowl (no splashing)
- 2" Fully Glazed trapway for effective waste removal
- Color matched metal tank lever
- 6 point tank to bowl connection for tank stability
- Sanitary bead for easy cleaning
- Color matched Bolt caps included
- Toilet seat not included



Technical Information:

Included Components:

- ☐ Combination VP-21-518
- ☐ Bowl VP-21-528
- ☐ Tank VP-28-590

Other Tank Options: (bowl to be purchased separately)

- ☐ Insulated Tank VP-28-592
- ☐ Tank with Right Hand Lever VP-28-590-97
- ☐ Insulated Tank with Lid Locking Device VP-28-592-LL

Fixtures:

Configuration	two-piece, ADA elongated
Water per Flush	1.6 gpf (6 lpf)
Rough-In	12"
Height	30 3/4"
Width	16 3/8"
Depth	29 3/8"
Trapway	2"
Large Water Surface	10 1/8" x 6 3/8"
Shipping Weight	81 lbs

Accessories:

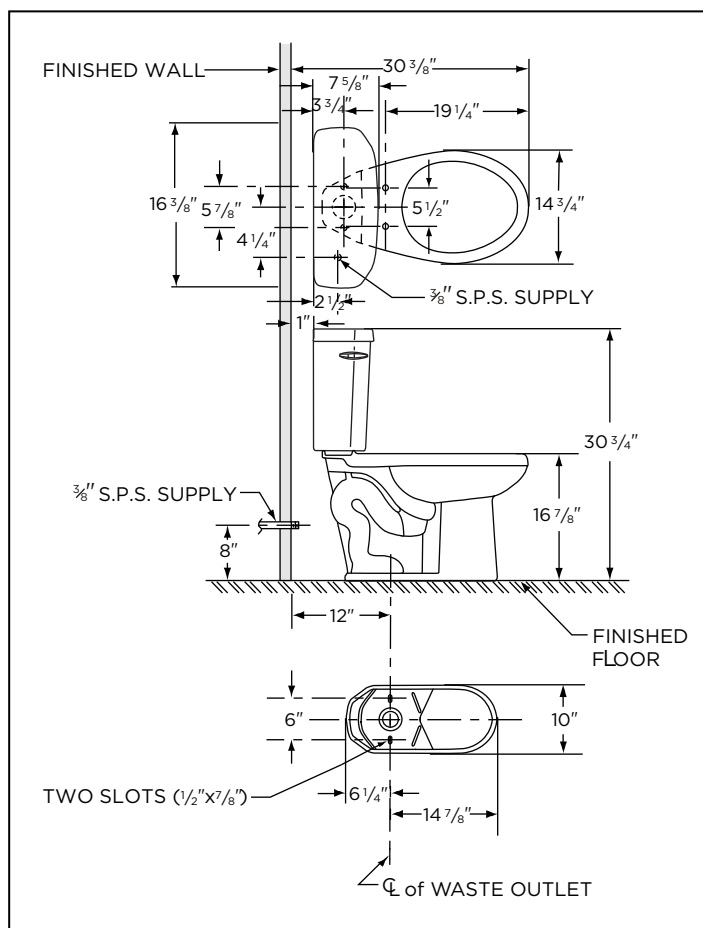
Soft Close Toilet Seat	99-213
------------------------	--------

Colors/Finishes:

- White
- Other: Refer to Price Book for additional colors/finishes

Warranty:

- Limited lifetime warranty



NOTES: All dimensions are in inches. Illustrations may not be drawn to scale.

IMPORTANT:

Dimensions of fixtures are nominal and may vary within the range of tolerances established by ASME standard A 112.19.2 THIS FIXTURE QUALIFIES ACCORDING TO ASME TEST PROCEDURES AS A HIGH EFFICIENCY WATER CLOSET WITH AN AVERAGE CONSUMPTION OF 1.28 gpf (4.8 Lpf) OR LESS.

MOEN®



Roll Over Image to Zoom

Moen 67315C Integra Single Handle Pullout Kitchen Faucet

by Moen Collection: Integra

Hot Buy Item!

\$132.57

FREE SHIPPING!

4.3

[Read 10 Reviews](#) | [Write a Review](#)

Finish: Chrome ▼



In Stock

Ships Tomorrow, 11/04/2019

Qty: 1

[Add to Cart](#)

A specifications document is currently not available for download. If you do not find the information you seek here, [ask one of our experts »](#)

[Installation Instructions](#)

ADA Compliant:	Yes	ASME A112.18.1 Certified:	Yes
CA Compliant:	No	Energy Star:	No
Escutcheon Included:	Yes	Filtering:	No
Flow Rate:	1.5 GPM	Handle Style:	Lever
Includes Drain:	No	Installation Type:	Deck





Water Efficiency Management Guide

Residential Kitchen and Laundry

The U.S. Environmental Protection Agency (EPA) WaterSense® program encourages property managers and owners to regularly input their buildings' water use data in [ENERGY STAR® Portfolio Manager®](#), an online tool for tracking energy and water consumption. Tracking water use is an important first step in managing and reducing property water use.

WaterSense has worked with ENERGY STAR to develop the EPA Water Score for multifamily housing. This 0-100 score, based on an entire property's water use relative to the average national water use of similar properties, will allow owners and managers to assess their properties' water performance and complements the ENERGY STAR score for multifamily housing energy use.

This series of Water Efficiency Management Guides was developed to help multifamily housing property owners and managers improve their water management, reduce property water use, and subsequently improve their EPA Water Score. However, many of the best practices in this guide can be used by facility managers for non-residential properties.

More information about the Water Score and additional Water Efficiency Management Guides are available at www.epa.gov/watersense/commercial-buildings.



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Background

From making meals to washing clothes, many tasks in households and multifamily residences require water. With today's technology, these tasks can be done in a way that uses much less water and energy without sacrificing comfort or performance. Proper maintenance of laundry facilities, kitchen fixtures, and appliances is also key to property water efficiency. Further, because many of these tasks use hot water, tenants and property owners will benefit from energy savings that accompany hot water savings.

Kitchens

The water-using fixtures and appliances in the kitchen, namely kitchen faucets and dishwashers, provide opportunity to reduce water use and costs for you and your residents.

In 1998, the U.S. Department of Energy adopted a uniform standard of 2.2 gallons per minute (gpm) at 60 pounds per square inch (psi) maximum flow rate standard for all faucets, including kitchen faucets. For comparison, the maximum flow rates for many of the pre-1992 faucets ranged from 3 to 7 gpm. That means a huge potential for savings in properties where kitchens haven't been updated.

Because kitchen faucets perform tasks such as filling pots and containers, as well as rinsing dishes and food; EPA's WaterSense program does not label them at this time. However, California recently passed an efficiency standard for kitchen faucets to have a maximum flow rate of 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi.¹ Many green building and water efficiency codes, such as the International Green Construction Code (IgCC)² and the International Association of Plumbing and Mechanical Officials (IAPMO) Green Plumbing and Mechanical Code Supplement,³ have also adopted similar requirements.

Similarly, today's dishwashers use significantly less water than older models to perform sufficiently. The average dishwasher now uses about 6 gallons per load of dishes, but older models require as much as 10 gallons per load.⁴ WaterSense does not label dishwashers, but ENERGY STAR® incorporates water efficiency factors in its certification criteria for dishwashers that earn the ENERGY STAR label. Standard-sized ENERGY STAR certified dishwashers may not exceed 3.5 gallons per load, whereas compact models that may be more common in multifamily properties may not exceed 3.1 gallons per load.⁵ Replacing existing dishwashers with ENERGY STAR labeled models reduces water use by up to 65 percent and reduces energy use by more than 10 percent.

¹ California Energy Commission (CEC). California Code of Regulations Title 20. Public Utilities and Energy Division 2. State Energy Resources Conservation and Development Commission. August 2016.

² The International Code Council (ICC). 2015 International Green Construction Code (IgCC). June 2015.

³ International Association of Plumbing and Mechanical Officials (IAPMO). 2015 Green Plumbing and Mechanical Code Supplement.

⁴ Water Research Foundation. DeOreo, William B., Peter W. Mayer, B. Dziegielwski and J. Kiefer. Residential End Uses of Water, Version 2. 2016. Table 6.15, Page 128.

⁵ U.S. Environmental Protection Agency (EPA) ENERGY STAR. ENERGY STAR Program Requirements Product Specification for Residential Dishwashers. Eligibility Criteria Version 6.0. Effective January 29, 2016.

Laundries

Second only to bathrooms, laundry is the second biggest residential water use. The average resident with in-unit laundry washes more than five loads of laundry per week, whereas tenants with common area laundry wash more than three loads per week.⁶ The average clothes washer uses 31 gallons per load, but older models can use more than 40 gallons per load.⁷ Washers built before 2003 use significantly more water than newer ones. High-efficiency, front-loading clothes washers can use as little as 13 gallons of water per load.⁸

Many properties provide centralized laundry facilities where residents wash their laundry. These areas often use commercial coin- or card-operated models. ENERGY STAR certified commercial washers have more capacity than conventional top-load models with an agitator. Some front-loaders can wash over 20 pounds of laundry at once, compared to 10 to 15 pounds for a standard top-loader, meaning residents can complete their laundry in fewer loads and with less water and energy. Commercial clothes washers that have earned the ENERGY STAR label use about 45 percent less water and up to 60 percent less energy than standard models.

WaterSense does not label clothes washers, but ENERGY STAR has established energy and water efficiency criteria for residential models (typically installed in-unit) and commercial models (installed in laundry rooms or common areas).⁹ Replacing existing clothes washers with ENERGY STAR labeled appliances provides the benefit of saving energy, water, and utility costs while also making your property more attractive to current and prospective residents.



Case Study: ENERGY STAR Clothes Washers Save Money, Please Residents

The property manager of Colesville Towers, an upscale multifamily apartment building with 272 units in Silver Spring, Maryland, sought to lower utility bills, reduce maintenance costs, and market a greener lifestyle to potential residents. As part of its revitalization, the apartment installed 14 new ENERGY STAR certified washing machines three years before the building's route operating contract came up for renewal. The new washers are at least 50 percent more water- and energy-efficient than standard commercial units, and reduced water use by 60 percent compared to their existing machines. The new units are expected to save Colesville Towers about \$2,600 per year on its utility bills. The property manager, Realty Management Services, and residents were satisfied with the switch. Long-time resident Janice Vaughan liked that the new clothes washers are quieter and more user friendly. She shared that, "you don't have to use as much detergent, which is nice. And I think they get the clothes cleaner."

More information on this case study can be found at:
www.energystar.gov/ia/products/appliances/clotheswash/508_ColesvilleTowers.pdf

⁶ National Research Center Inc. *A National Study of Water & Energy Consumption in Multifamily Housing*. November 2012 (revised). www.mla-online.com/pdf/NRC-2002-A-National-Study-of-Water-and-Energy-Consumption-in-Multi-Family-Housing.pdf

⁷ Water Research Foundation. DeOreo, William B., Peter W. Mayer, B. Deziegielwski and J. Kiefer. *Residential End Uses of Water*, Version 2. 2016. Table 6.14, Page 127.

⁸ ENERGY STAR. Clothes Washers Overview. www.energystar.gov/products/appliances/clothes_washers

⁹ ENERGY STAR defines a commercial clothes washer as "a soft-mounted front-loading or soft-mounted top-loading clothes washer that is designed for use in applications in which the occupants of more than one household will be using the clothes washer, such as multifamily housing common areas and coin laundries."

Maintenance Best Management Practices

Performing periodic inspections within your kitchens and laundry areas will help keep equipment operating efficiently and catch water waste before it impacts your water bill. Aim to conduct inspections at least annually, or consider how checks might be incorporated during tenant changes or combined with other unit inspections. Table 1 provides a summary of inspection items that should be performed periodically and other operational best management practices.

Product Type	Tip	Why
All	Look at the base of dishwashers, refrigerators (if they have a water connection for ice makers), and clothes washers to see if any puddling is occurring. Verify that water connection hoses and drain lines are installed properly so that leaks aren't occurring at the connections. Repair or replace any water lines that are leaking or showing signs of wear and tear.	Leaks not only waste water, but can also cause soft spots, mold, and other damage in flooring.
Kitchen faucets	Scale buildup can occur when minerals accrue on the faucet's aerator or end device. Inspect kitchen faucet aerators for scale buildup and clean or replace the aerator or other spout end device if necessary.	Scale buildup can cause performance issues, resulting in occupants removing faucet aerators and increasing the faucet flow rate.
Clothes washers	Work with your laundry route operator ¹⁰ or equipment vendor to provide ongoing service and maintenance. If using a service agreement for a common-use laundry facility, be sure to request ENERGY STAR certified commercial laundry appliances be installed, if available.	Just like a car or an A/C unit, having laundry equipment regularly serviced will help ensure it maintains its efficiency and lasts longer.
Clothes washers	For clothes washers in laundry rooms or other common areas, include educational materials or signage to save water by only washing full loads of laundry. If you have high-efficiency clothes washers, remind residents to use detergents specifically formulated for these types of machines. Signage should also include contact information for maintenance personnel so residents can report leaks or other malfunctions in the laundry areas.	Even the most environmentally conscious residents can use encouragement and reminders.

¹⁰ Laundry route operators are companies that supply commercial laundry equipment to properties, including multifamily properties, and maintain the equipment. Typically, the laundry route operator and the property will share the revenues from laundry equipment at the building.

Retrofit and Replacement Options

If installing new kitchen and laundry appliances or replacing older ones, consider installing ENERGY STAR certified models or other water efficient alternatives. ENERGY STAR labeled appliances are certified to save energy and water. As a general rule of thumb, consider replacing dishwashers and clothes washers that are more than 10 years old with new, ENERGY STAR certified models.

- **Kitchen faucets:** Many new kitchen faucets have a flow rate between 1.5 and 1.8 gpm, reducing flow by at least 18 percent when compared to standard kitchen faucets. Alternatively, if the aerator or flow control device on the kitchen faucet can be easily removed and replaced, install a new aerator flowing at 1.8 gpm or less. New aerators only cost a few dollars and will have an equivalent effect on saving water and energy.
- **Dishwashers:** ENERGY STAR's current water performance requirements for dishwashers allow a maximum water consumption of 3.5 gallons per cycle for standard dishwashers and 3.1 gallons per cycle for compact dishwashers, reducing water use by as much as 65 percent reduces energy use by more than 10 percent when compared to older models¹¹.
- **Clothes washers:** A full-sized, front-loading ENERGY STAR certified clothes washer uses 13 gallons of water per load, compared to a new, standard machine, which uses 23 gallons or more per load. The Integrated Water Factor (IWF) is a metric, measured in gallons per cycle per cubic foot, that is used in the ENERGY STAR requirements to help consumers identify products that use less water than standard models. The lower the water factor, the more water-efficient the washer. Commercial clothes washers that have earned the ENERGY STAR label use about 45 percent less water and up to 60 percent less energy than standard models.¹²



If laundry equipment is provided through a laundry route operator or equipment vendor, work with them to identify opportunities for replacing existing equipment with ENERGY STAR certified models. Alternatively, they can help identify other opportunities for water and energy savings. If your current vendor is unwilling or unable to support you in your efficiency goals, consider switching to a commercial laundry route operator that is an [ENERGY STAR partner](#).¹³

You can identify ENERGY STAR certified dishwasher and clothes washer models by using the [ENERGY STAR Product Finder Tool](#)¹⁴ and by looking for the ENERGY STAR label (shown above) on product packaging and websites. Be sure to check the [ENERGY STAR Rebate Finder](#)¹⁵ to see if there are any rebates available in your area.

¹¹ ENERGY STAR. Dishwashers Key Product Criteria. www.energystar.gov/products/appliances/dishwashers/key_product_criteria

¹² ENERGY STAR. Appliance Calculator. www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/purchase-energy-saving-products

¹³ ENERGY STAR. Commercial Laundry Route Operators and Distributors.

www.energystar.gov/products/appliances/commercial_clothes_washers/commercial_laundry_route_operators_and_distributors

¹⁴ ENERGY STAR. Product Finder. www.energystar.gov/productfinder/

¹⁵ ENERGY STAR. Rebate Finder. www.energystar.gov/rebate-finder

Water Savings Calculations and Assumptions

To estimate water and energy savings from replacing existing kitchen and laundry appliances and fixtures with more water-efficient models, review the calculations for each fixture type. The sources for assumptions included in the calculations are provided in the Appendix.

Kitchen Sink Faucets

Replacing existing kitchen faucets or faucet aerators flowing at 2.2 gpm or more with high-efficiency models rated at 1.8 gpm or less can help reduce water use.

Use Equation 1 below to estimate water savings from replacing kitchen faucets or faucet aerators flowing at 2.0 gpm or more with high-efficiency models rated at 1.8 gpm or less. This equation uses the maximum flow rates for your faucet, but average flow rates are typically lower, due to supply pressure and throttling of faucets by users (where faucets are not used at full flow). Therefore, the estimated savings provided by Equation 1 is the maximum potential savings from kitchen faucet retrofit. The California Energy Commission estimated that a household replacing an existing kitchen faucet with a high-efficiency model would save approximately 1,100 gallons annually.¹⁶

Equation 1. Water Savings From Kitchen Faucet/Faucet Aerator Replacement (gallons per year)

$$\left(\begin{array}{c} \boxed{} \\ \text{Existing} \\ \text{Average Kitchen} \\ \text{Faucet Flow} \\ \text{Rate} \end{array} - \begin{array}{c} \boxed{1.8 \text{ gpm} \\ \text{or Less}} \\ \text{Replacement} \\ \text{Average Kitchen} \\ \text{Faucet Flow} \\ \text{Rate} \end{array} \right) \times \begin{array}{c} \boxed{25.7} \\ \text{Minutes per} \\ \text{Household per} \\ \text{Day} \end{array} \times \begin{array}{c} \boxed{365} \\ \text{Days per Year} \end{array} = \begin{array}{c} \boxed{} \\ \text{Gallons Saved} \\ \text{per Year} \end{array}$$

Because kitchen faucets typically use hot water, any resulting water savings will also save energy. Electricity savings (for electric water heaters) and natural gas savings (for natural gas water heaters) can be calculated using Equation 2a and 2b, respectively. If the efficiency of the hot water heater is unknown, consider using 100 percent efficiency for electric heaters and 75 percent for natural gas heaters to conservatively estimate energy savings.

¹⁶ California (2013) Codes and Standards Enhancement Initiative (CASE): Analysis of Standards Proposal for Residential Faucets and Faucet Accessories. Tables 5.1 and 5.4, pages 9,14.

Equation 2a. Electricity Savings From Kitchen Faucet/Faucet Aerator Replacement (kilowatt hour [kWh] per year; for electric hot water heating)

$$\left(\boxed{} \times 57\% \times 0.183 \right) \div \boxed{} = \boxed{}$$

Kitchen Faucet Gallons of Water Savings per Year Percentage of Hot Water Used kWh of Electricity Required to Heat One Gallon of Water Water Heater Efficiency* kWh Saved per Year

**Use 100% if exact electric heater efficiency is unknown*

Equation 2b. Natural Gas Savings From Kitchen Faucet/Faucet Aerator Replacement (thousand cubic feet [Mcf] per year; for natural gas hot water heating)

$$\left(\boxed{} \times 57\% \times 0.0061 \right) \div \boxed{} = \boxed{}$$

Kitchen Faucet Gallons of Water Savings per Year Percentage of Hot Water Used Mcf on Natural Gas Required to Heat One Gallon of Water Water Heater Efficiency* Mcf Saved per Year

**Use 75% if exact natural gas heater efficiency is unknown*

Dishwashers

To estimate water savings from replacing older, inefficient dishwashers with ENERGY STAR certified models using less than 3.5 gallons per load, use Equation 3.

**Equation 3. Water Savings From Dishwasher Replacement
(gallons per year)**

$$\left(\boxed{\text{Existing Dishwasher Gallons per Load}} - \boxed{3.5 \text{ gal or Less}} \right) \times \boxed{0.1} \times \boxed{\text{\# of Occupants}} \times \boxed{365} = \boxed{\text{Gallons Saved per Year}}$$

Existing Dishwasher Gallons per Load
Replacement Dishwasher Gallons per Load
Loads per Person per Day
\# of Occupants
Days per Year
Gallons Saved per Year

Because dishwashers are supplied by hot water lines, water savings will also result in associated energy savings. Electricity savings (for electric water heaters) and natural gas savings (for natural gas water heaters) can be calculated using Equation 4a and 4b, respectively. If the efficiency of the hot water heater is unknown, consider using 100 percent efficiency for electric heaters and 75 percent for natural gas heaters to conservatively estimate energy savings.

**Equation 4a. Electricity Savings From Dishwasher Replacement
(kWh per year; for electric hot water heating)**

$$\left(\boxed{\text{Dishwasher Gallons of Water Savings per Year}} \times \boxed{100\%} \times \boxed{0.183} \right) \div \boxed{\text{Water Heater Efficiency}^*} = \boxed{\text{Kwh Saved per Year}}$$

Dishwasher Gallons of Water Savings per Year
Percentage of Hot Water Used
kWh of Electricity Required to Heat One Gallon of Water
Water Heater Efficiency*
Kwh Saved per Year

**Use 100% if exact electric heater efficiency is unknown*

**Equation 4b. Natural Gas Savings From Dishwasher Replacement
(Mcf per year; for natural gas hot water heating)**

$$\left(\boxed{\text{Dishwasher Gallons of Water Savings per Year}} \times \boxed{100\%} \times \boxed{0.0061} \right) \div \boxed{\text{Water Heater Efficiency}^*} = \boxed{\text{Mcf Saved per Year}}$$

Dishwasher Gallons of Water Savings per Year
Percentage of Hot Water Used
Mcf on Natural Gas Required to Heat One Gallon of Water
Water Heater Efficiency*
Mcf Saved per Year

**Use 75% if exact natural gas heater efficiency is unknown*

Clothes Washers

To estimate water savings from replacing older, inefficient clothes washers with ENERGY STAR certified models using less than 20 gallons per load, use Equation 5. If the gallons per load is unknown, use the default volumes provided in Table 2 to estimate savings.

Alternatively, use the [ENERGY STAR Appliance Calculator¹⁷](#) to estimate water and energy savings from installing ENERGY STAR appliances, including clothes washers.

Equation 5. Water Savings from Clothes Washer Replacement (gallons per year)

$$\left(\begin{array}{c} \boxed{} \\ \text{Existing Clothes} \\ \text{Washer Gallons} \\ \text{per Load} \end{array} - \begin{array}{c} \boxed{} \\ \text{Replacement} \\ \text{Clothes Washer} \\ \text{Gallons per} \\ \text{Load} \end{array} \right) \times \begin{array}{c} \boxed{0.3} \\ \text{Loads per} \\ \text{Person per Day} \end{array} \times \begin{array}{c} \boxed{} \\ \text{\# of Occupants} \end{array} \times \begin{array}{c} \boxed{365} \\ \text{Days per Year} \end{array} = \begin{array}{c} \boxed{} \\ \text{Gallons Saved} \\ \text{per Year} \end{array}$$

Table 2. Estimated Water Use per Load of Laundry for Various Clothes Washers

Clothes Washer Type	Gallons per Load
Residential Top-Loading	
Older, Inefficient Top-Loading (4.5 cubic feet)	41 gallons (or more) per load
New Conventional Top-Loading (4.5 cubic feet)	37.8 gallons per load
ENERGY STAR Certified Top-Loading (4.5 cubic feet)	19.4 gallons per load
Residential Front-Loading	
New Conventional Front-Loading (4.0 cubic feet)	18.8 gallons per load
ENERGY STAR Certified Front-Loading (4.0 cubic feet)	14.8 gallons (or less) per load
ENERGY STAR Certified Compact (≤ 2.5 cubic feet)	10.5 gallons per load
Commercial	
New Conventional Top-Loading Commercial (2.8 cubic feet)	23.8 gallons per load
New Conventional Front-Loading Commercial (2.8 cubic feet)	15.4 gallons per load
ENERGY STAR Certified Commercial (2.8 cubic feet)	12.6 gallons (or less) per load

¹⁷ ENERGY STAR. Appliance Calculator. www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/purchase-energy-saving-products

Because clothes washers used hot water, saving water will also save energy. To calculate electricity savings (for electric water heaters) and natural gas savings (for natural gas water heaters), substitute the Annual Diverter Water Savings with the Annual Showerhead Water Savings in Equations 5a and 5b on the previous page.

Equation 5a. Electricity Savings From Clothes Washer Replacement (kWh per year; for electric hot water heating)

$$\left(\boxed{} \times 20\% \times 0.183 \right) \div \boxed{} = \boxed{}$$

Clothes Washer Gallons of Water Savings per Year Percentage of Hot Water Used kWh of Electricity Required to Heat One Gallon of Water Water Heater Efficiency* Kwh Saved per Year

**Use 100% if exact electric heater efficiency is unknown*

Equation 5b. Natural Gas Savings From Clothes Washer Replacement (Mcf per year; for natural gas hot water heating)

$$\left(\boxed{} \times 20\% \times 0.0061 \right) \div \boxed{} = \boxed{}$$

Clothes Washer Gallons of Water Savings per Year Percentage of Hot Water Used Mcf on Natural Gas Required to Heat One Gallon of Water Water Heater Efficiency* Mcf Saved per Year

**Use 75% if exact natural gas heater efficiency is unknown*

Additional Resources

Alliance for Water Efficiency Resource Library. Residential Clothes Washer Introduction.
www.allianceforwaterefficiency.org/Residential_Clothes_Washer_Introduction.aspx

Alliance for Water Efficiency Resource Library. Residential Dishwasher Introduction.
www.allianceforwaterefficiency.org/Residential_Dishwasher_Introduction.aspx

EPA's ENERGY STAR Program Resources:

Clothes Washers.

www.energystar.gov/products/appliances/clothes_washers

Commercial Clothes Washers.

www.energystar.gov/products/appliances/commercial_clothes_washers

Commercial Laundry Route Operators and Distributors.

www.energystar.gov/products/appliances/commercial_clothes_washers/commercial_laundry_route_operators_and_distributors

Dishwashers.

www.energystar.gov/products/appliances/dishwashers

EPA's WaterSense program. *WaterSense at Work. Best Management Practices for Commercial and Institutional Facilities.*

www.epa.gov/watersense/best-management-practices

Appendix A: Summary of Water Efficiency Measures and Savings

This appendix can be used to summarize water efficiency measures, upgrades, and projects that are identified at your property, based on a water assessment and/or review of this Water Efficiency Management Guide.

Summary of Water Efficiency Measures and Savings

Item Number	Location	Measure or Project Name and Description	Projected Annual Water Savings (gallons)	Projected Annual Energy Savings	Projected Annual Water, Wastewater, and Energy Cost Savings (\$)	Total Measure or Project Cost (\$)	Simple Project Payback (years)
Example	Basement laundry area	Replace five existing clothes washers with ENERGY STAR certified commercial front-loading clothes washers. New clothes washers are each \$1,500; however water utility will provide a \$100 rebate for each.	180,000 gallons	7,300 kWh	Water & Wastewater Cost Savings: \$1,980 Energy Cost Savings: \$750 Total: \$2,730	\$7,000	2.6 years
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

Appendix B: References for Calculation Assumptions

Variable	Suggested Value	Units	Reference
Kitchen Faucets			
Existing Average Kitchen Faucet Flow Rate	2.2	gallons per minute (gpm)	EPAct 1992
Replacement Average Kitchen Faucet Flow Rate	1.8 or less	gpm	Best practice based on various green construction and water efficiency codes.
Minutes per Household per Day	25.7	minutes	California (2013) Codes and Standards Enhancement Initiative (CASE): Analysis of Standards Proposal for Residential Faucets and Faucet Accessories. Table 5.4, page 13.
Days per Year	365	days	Constant
Percentage of Faucet Water Used That Is Hot Water	57.0	percent	Water Research Foundation (WRF). DeOreo, William B., Peter Mayer, Benedykt Dziegielewski and Jack Kiefer. <i>Residential End Uses of Water, Version 2</i> . 2016. Table 6.25, Page 138.
Electric Hot Water Heater Efficiency	Building/Unit Specific (use 100 percent efficiency if unknown)		U.S. Department of Energy (2014) <i>Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Residential Clothes Washers</i> . Office of Energy Efficiency and Renewable Energy (EERE), Building Technologies Program, Appliances and Commercial Equipment Standards, p. 7-1
Mcf of Natural Gas Required to Heat One Gallon of Water 75°F	0.00061	Mcf/gallon	WaterSense calculation assuming: - Specific heat of water = 1.0 Btu/lb x °F 1 gallon of water = 8.34 lbs 1 Therm = 99,976 Btus 1 Mcf of natural gas = 10.307 therms Incoming water temperature is raised 75°F
Natural Gas Hot Water Heater Efficiency	Building/Unit Specific (use 75 percent efficiency if unknown)		U.S. Department of Energy (2014). <i>Op. Cit.</i>
Dishwashers			
Replacement Dishwasher Gallons per Load	3.5 or less	gallons	EPA ENERGY STAR, 2016. Dishwashers Key Product Criteria. Effective January 29, 2016
Dishwasher Loads per Person per Day	0.1	loads per person per day	WRF. <i>Op. Cit.</i> Table 6.15, Page 128.
Days per Year	365	days	Constant
Percentage of Dishwater Water Used That Is Hot Water	100	percent	WRF. <i>Op. Cit.</i> Table 6.25, Page 138.
kWh of Electricity Required to Heat One Gallon of Water 75°F	0.183	kWh/gallon	WaterSense calculation assuming: - Specific heat of water = 1.0 Btu/lb x °F 1 gallon of water = 8.34 lbs 1 kWh = 3,412 Btus - Incoming water temperature is raised 75°F

Variable	Suggested Value	Units	Reference
Electric Hot Water Heater Efficiency	Building/Unit Specific (use 100 percent efficiency if unknown)		U.S. Department of Energy (2014). <i>Op. Cit.</i>
Mcf of Natural Gas Required to Heat One Gallon of Water 75°F	0.00061	Mcf/gallon	WaterSense calculation assuming: - Specific heat of water = 1.0 Btu/lb x °F 1 gallon of water = 8.34 lbs 1 Therm = 99,976 Btus 1 Mcf of natural gas = 10.307 therms - Incoming water temperature is raised 75°F
Natural Gas Hot Water Heater Efficiency	Building/Unit Specific (use 75 percent efficiency if unknown)		U.S. Department of Energy (2014). <i>Op. Cit.</i>
Clothes Washers			
Older, Inefficient Top-Loading (4.5 cubic feet)	41	gallons per load	Water Research Foundation. DeOreo, William B., Peter W. Mayer, B. Deziegielwski and J. Kiefer. Residential End Uses of Water, Version 2. 2016. Table 6.14, Page 127.
New Conventional Top-Loading (4.5 cubic feet)	37.8	gallons per load	ENERGY STAR. Appliance Calculator.
ENERGY STAR Certified Top-Loading (4.5 cubic feet)	19.4	gallons per load	ENERGY STAR. Appliance Calculator.
New Conventional Front-Loading (4.0 cubic feet)	18.8	gallons per load	ENERGY STAR. Appliance Calculator.
ENERGY STAR Certified Front-Loading (4.0 cubic feet)	14.8	gallons per load	ENERGY STAR. Appliance Calculator.
ENERGY STAR Certified Compact (≤ 2.5 cubic feet)	10.5	gallons per load	ENERGY STAR. Appliance Calculator.
New Conventional Top-Loading Commercial (2.8 cubic feet)	23.8	gallons per load	ENERGY STAR. Appliance Calculator.
New Conventional Front-Loading Commercial (2.8 cubic feet)	15.4	gallons per load	ENERGY STAR. Appliance Calculator.
ENERGY STAR Certified Commercial (2.8 cubic feet)	12.6	gallons per load	ENERGY STAR. Appliance Calculator.
Clothes Washer Loads per Person per Day	0.3	loads per person per day	WRF. <i>Op. Cit.</i> Table 6.14, Page 127.
Days per Year	365	days	Constant
Percentage of Clothes Washer Water Used That Is Hot Water	20.0	percent	WRF. <i>Op. Cit.</i> Table 6.25, Page 138.
kWh of Electricity Required to Heat One Gallon of Water 75°F	0.183	kWh/gallon	WaterSense calculation assuming: - Specific heat of water = 1.0 Btu/lb x °F 1 gallon of water = 8.34 lbs 1 kWh = 3,412 Btus - Incoming water temperature is raised 75°F

Variable	Suggested Value	Units	Reference
Electric Hot Water Heater Efficiency	Building/Unit Specific (use 100 percent efficiency if unknown)		U.S. Department of Energy (2014). <i>Op. Cit.</i>
Mcf of Natural Gas Required to Heat One Gallon of Water 75°F	0.00061	Mcf/gallon	WaterSense calculation assuming: • Specific heat of water = 1.0 Btu/lb x °F • 1 gallon of water = 8.34 lbs • 1 Therm = 99,976 Btus • 1 Mcf of natural gas = 10.307 therms • Incoming water temperature is raised 75°F
Natural Gas Hot Water Heater Efficiency	Building/Unit Specific (use 75 percent efficiency if unknown)		U.S. Department of Energy (2014). <i>Op. Cit.</i>

WAKE COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER PERMIT

NO PERMIT(S) FOR CONSTRUCTION, LOCATION OR RELOCATION ACTIVITY SHALL BE ISSUED UNTIL AN AUTHORIZATION FOR WASTEWATER SYSTEM CONSTRUCTION AUTHORIZATION HAS BEEN ISSUED

PERMIT VOID IF NOT IN COMPLIANCE WITH ZONING REGULATIONS AND/OR IF SITE IS ALTERED OR INTENDED USE CHANGED

IMPROVEMENT PERMIT

PERMIT #: WRP-026251-2019

APPLICATION DATE: 09/30/2019

BLDG. PERMIT #: RBPR-026213-2019

PIN: 1719873863

RECORDED: Yes

TOWNSHIP: 02 - Bartons Creek

JURISDICTION: Wake County

ZONING: R-80W

APPLICANT: Tall Tradition Building
8916 Lindenshire RD

BUSINESS PHONE: (919) 427-6284

HOME PHONE:

MOBILE PHONE: (919) 427-6284

HD USE: 101A CONVENTIONAL ONE-FAMILY HOUSE

EXISTING USE:

SITE ADDRESS: 1421 ALPINE CREEK DR

SUBDIVISION: ALPINE CREEK ESTATES

LOT: 18

ACRES: 2.11

DIRECTIONS: Falls of Neuse north to left on Raven ridge 2 miles turn right on Hardie Rd. 1/4 mile turn right on Alpine Creek Drive. Entry code is #7420. Lot 18 is at end of road in cul de sac.

Permit is subject to revocation if the Site Plan or Plat changes or the intended use changes.

*Maximum depth of line is calculated using the downhill side of the trench and includes slope correction.

IP VALID FOR: Five Years AS PER GS 130A-335 (f)

DESIGNED BY: CCSC

SYSTEM LAYOUT: Staff

SITE CLASSIFICATION: Provisionally Suitable

IP STATUS: Issued

BY: Michael Seewald

DATE: 11/08/2019

NUMBER OF BEDROOMS: 5

OR TOTAL NUMBER OF OCCUPANTS: 10

PERMITTED DESIGN FLOW: 480 GPD

BASEMENT: Yes

BASEMENT PLUMBING: Yes

WASTEWATER STRENGTH: Domestic

SYSTEM TYPE: III B

LTAR: 0.300

EXISTING SYSTEM UTILIZED:

PRETREATMENT STRENGTH REQUIRED:

EASEMENT FOR WW SYSTEM ASSOCIATED WITH PARCEL: No

MAXIMUM TRENCH DEPTH: 18 INCHES

PUMP REQUIRED: Yes

SPECIFIC SYSTEM REQUIREMENTS: - System designed for 5 bedroom home, having 480 gals per day (Engineered Flow Reduction used).

- Future Repair is a type V C system with a Max Trench depth of 12" and a 0.15 LTAR.
- Site serviced by Private Well water.
- No cutting, grading, alterations, or utilities in septic area.
- Maintain all required setbacks.

ISSUED BY:

A handwritten signature in black ink, appearing to read "Michael S. Smith". The signature is fluid and cursive, with a large initial "M" and a long, sweeping underline.

DATE: 11/08/2019

PROPOSED PLOT PLAN FOR:
**TALL TRADITIONS BUILDING
COMPANY LLC**

LOT 18
ALPINE CREEK
BOOK OF MAPS 2019 PAGE 1408,
PIN: 1788-87-3863
BARTONS CREEK TOWNSHIP
WAKE COUNTY, NORTH CAROLINA
ADDRESS: 1421 ALPINE CREEK DRIVE

REFERENCES

- 1. B.M. 2019 PG 1408
- 2. WAKE COUNTY GIS.

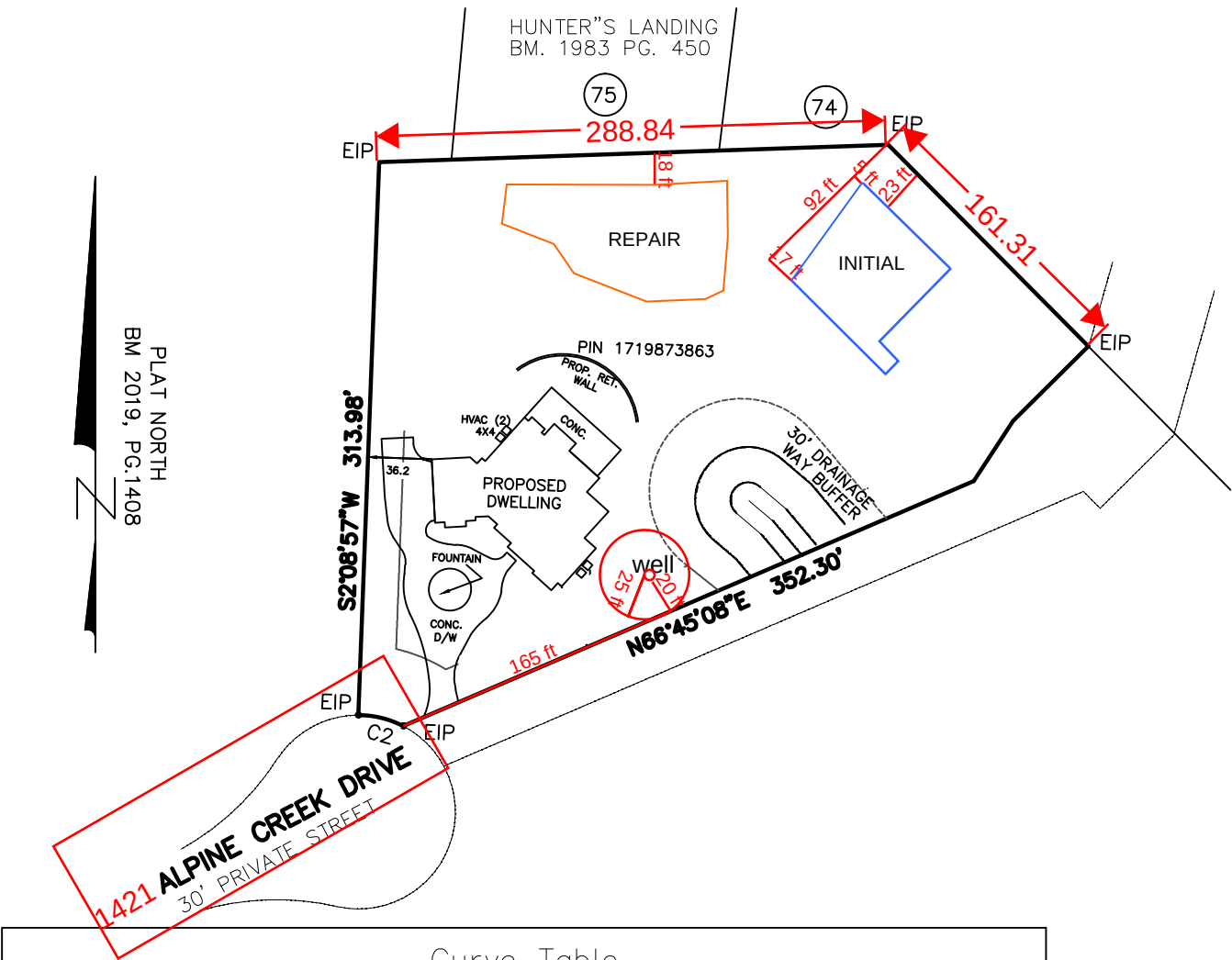
PROPOSED IMPERVIOUS
DWELLING_____5,403 SF
CONCRETE_____4,804 SF
TOTAL _____11,372 SF
85% OF ALLOWABLE IS PROPOSED



Required Setbacks

Front 40
Side 20
Rear 30
Corner

- NOTES
- 1. AREA BY COORDINATE CALCULATION.
 - 2. PROPERTY IS SUBJECT TO ALL EASEMENTS AND RIGHT-OF-WAYS OF RECORD PRIOR TO THE DATE OF
 - 3. NO GRID MONUMENTS FOUND WITHIN 2000' OF PROPERTY.
 - 4. THIS PLAT IS A CORRECT REPRESENTATION OF THE LAND PLATTED AND HAS BEEN PREPARED IN CONFORMITY WITH NORTH CAROLINA STANDARDS, GS47-30, AND REQUIREMENTS OF LAW, BUT A NORTH CAROLINA LICENSED ATTORNEY-AT-LAW SHOULD BE CONSULTED REGARDING CORRECT OWNERSHIP, WIDTH AND OWNERSHIP OF EASEMENTS AND OTHER TITLE QUESTIONS REVEALED BY A TITLE EXAMINATION.



Curve Table					
CURVE #	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C2	27°29'26"	55.00	26.39	N76°15'08"W	26.14

LINE TABLE		
LINE #	BEARING	LENGTH
L1	N45° 13' 08.81"E	59.94
L2	N33° 13' 44.59"E	40.89

LEGEND
EIP=EXISTING IRON PIPE
EIS=EXISTING IRON STAKE
IPS=IRON PIPE SET
R/W=RIGHT OF WAY
[0000] = STREET ADDRESS
13,346 S.F. = MAX. IMPERVIOUS AREA

THIS PROPERTY IS NOT LOCATED IN A
F.E.M.A. 100 YEAR FLOOD HAZARD AREA.
REFERENCE: F.E.M.A. COMMUNITY PANEL NO. 3720078800 J
EFFECTIVE DATE: 05/02/2006

STEWART-PROCTOR
ENGINEERING and SURVEYING
319 CHAPANOKE ROAD, SUITE 106
RALEIGH, NC 27603 (LICENSE # P-0148)
TEL. 919 779-1855 FAX 919 779-1661

DATE 09/17/19 DRAWING

SCALE 1"=100'

