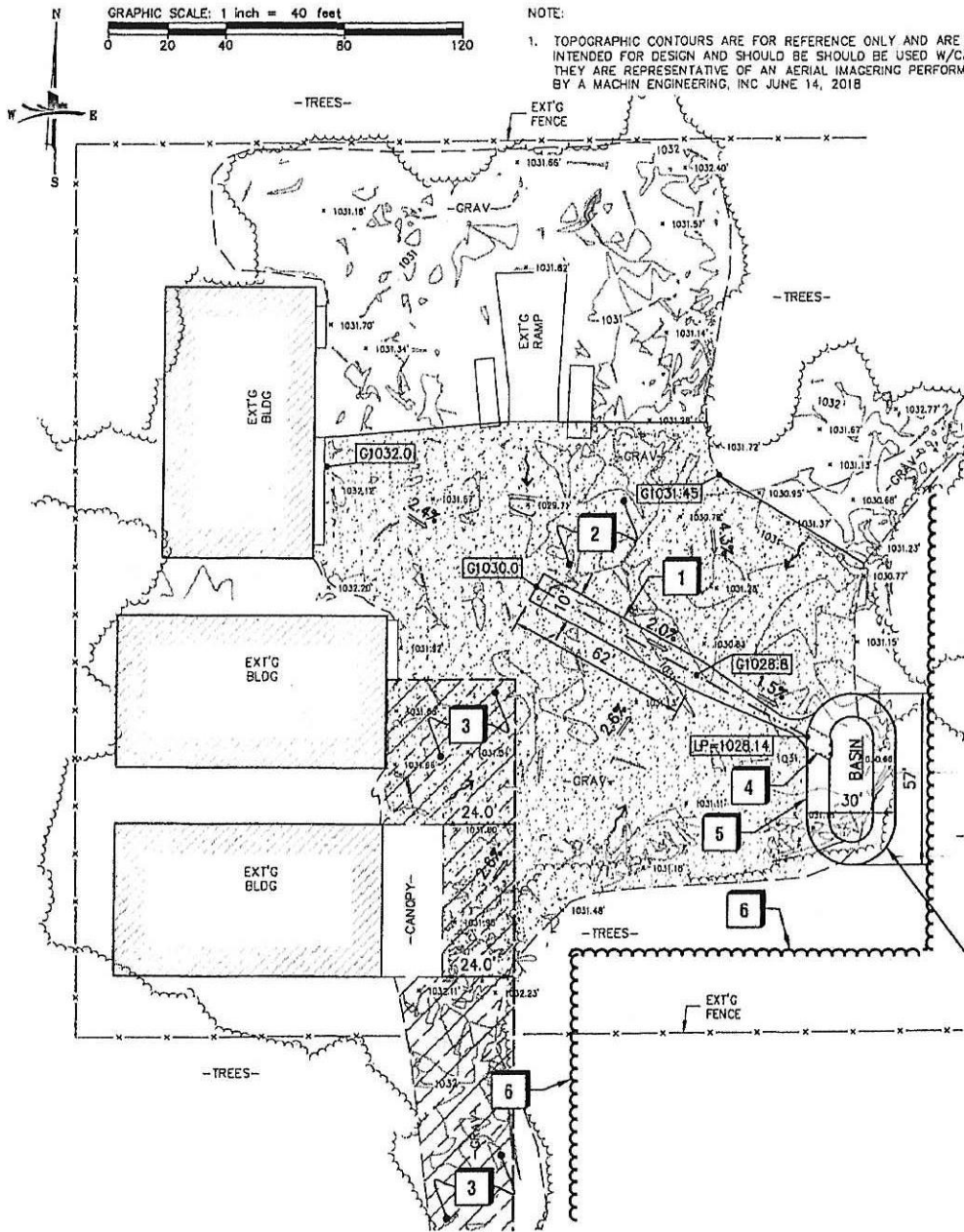


NOTE:

1. TOPOGRAPHIC CONTOURS ARE FOR REFERENCE ONLY AND ARE NOT INTENDED FOR DESIGN AND SHOULD BE USED W/CARE. THEY ARE REPRESENTATIVE OF AN AERIAL IMAGING PERFORMED BY A MACHIN ENGINEERING, INC JUNE 14, 2018



KEY NOTES

- 1 INSTALL 10'x62' FLAT BOTTOM SWALE
 - 2 INSTALL 6" 23A AGGREGATE BASE SEE DETAIL '1/C3'
 - 3 INSTALL 3" 21A CRUSHED STONE OVER 6" 23A SEE DETAIL '2/C3'
 - 4 INSTALL 10 CYD 8"-10" RIP RAP ON GEOTEXTILE FABRIC SEE DETAIL '4/C3'
 - 5 INSTALL 2.5' DEEP BASIN SEE DETAIL '3/C3'
 - 6 CLEAR TREES WHERE REQUIRED
- PROPOSED GRAVEL SWALE
 SPOT GRADE
 G = GRAVEL GRADE
 DIRECTION OF DRAINAGE

STORMWATER CALCUALTIONS:

EXISTING RUNOFF
 AREA OF EXISTING GRAVEL = 26406 SF
 $Q = (.95)(2.09'/HR)(A)$ (2 YEAR, 24-HR) = 1.99"

DESIGN RUNOFF
 AREA OF PROPOSED GRAVEL = 26406 SF
 $Q = (.95)(3.89'/HR)(A)$ (25 YEAR, 24-HR) = 3.70"
 $3.70" - 1.99" = 1.71"$
 IMPERVIOUS AREA = 26406 SFT

DESIGN VOLUME
 VOLUME REQ = 26406 SFT (1.71" * 1FT/12") = 3763 CFT
 INFILTRATION RATE IS 2.0"/HR

BASIN
 BOTTOM AREA OF BASIN = 582 SFT
 AVERAGE AREA OF BASIN = 1050 SFT
 INFILTRATION VOL = 582 SFT(2"/HR*1FT/12"* 24HR) = 2328 CFT
 VOLUME RETENTION = (1050 SFT) (2.5 FT) = 2625 CFT
 VOLUME PROVID = 2328 CFT + 2625 CFT = 4952 CFT
 MAXIMUM DRAIN TIME FOR REQUIRED VOLUME
 $72 > 120/1 = 12(2.5')/2"/HR = 15.00 HR < 72 HR$

TOTAL VOLUME PROVID = 2328 CFT + 2625 CFT = 4952 CFT > 3763 CFT REQ.

BASIN
 BTM EL = 1026'
 TOP EL = 1028.5'
 VOL. REQ'D = 3763
 VOL. PROVID = 4952 CFT



MACHINENGINEERING
 Incorporation
 TRAVERSE CITY, MI PH 231.935.1530
 LUDINGTON, MI
 www.machinengineering.net

REGISTRATION:
 I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A QUALY LICENSED PROFESSIONAL ENGINEER UNDER LAWS OF THE STATE OF MICHIGAN!

PATRICK J. MACHIN
 PRINT NAME
 SIGNATURE
 6/30/2018 14:11 EXP. 10/31/2018 DATE
 REG. NO.
 MACHIN ENGINEERING, INC.
 ORIGINAL DOCUMENT(S) ARE STORED AT

REV	DESCRIPTION	DATE
A	REVIEW - 30% DESIGN	04/29/2018
B	REVIEW - 60% DESIGN	04/29/2018
C	ISSUED FOR REVIEW	04/29/2018
D	REVIEW - 90% DESIGN	04/29/2018
E	ISSUED FOR CONSTRUCTION	04/29/2018

PROJECT TITLE:
**KALKASKA COUNTY
 RECYCLING
 CENTER
 STORMWATER**

CLIENT:
 KALKASKA CO RECYCLING
 904 ISLAND LAKE RD.,
 KALKASKA, MI 49646

SHEET TITLE:
**PROPOSED
 GRADING
 DRAINAGE
 PLAN**

PROJECT NUMBER **18078**
 SHEET NUMBER **C2**

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PRINT NAME

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6201051471 EXP. 10/31/2018
REG. NO. DATE

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ORIGINAL DOCUMENT(S) ARE STORED AT

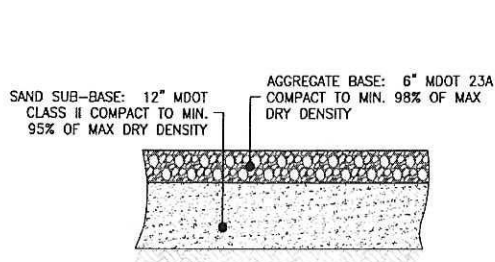
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B	REVIEW - 60% DESIGN	04/09/2018
C	ISSUED FOR REVIEW	04/09/2018
D	REVIEW - 90% DESIGN	04/07/2018
E	ISSUED FOR CONSTRUCTION	04/07/2018

PROJECT TITLE:
**KALKASKA COUNTY
RECYCLING
CENTER
STORMWATER**

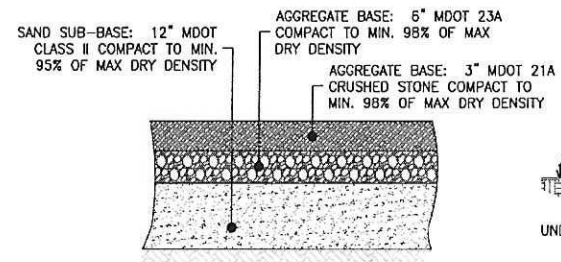
CLIENT:
KALKASKA CO RECYCLING
904 ISLAND LAKE RD.,
KALKASKA, MI 49646

SHEET TITLE:
DETAILS

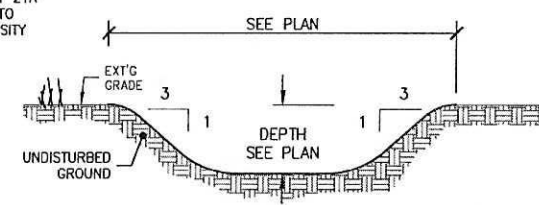
PROJECT NUMBER **18078**
SHEET NUMBER **C3**



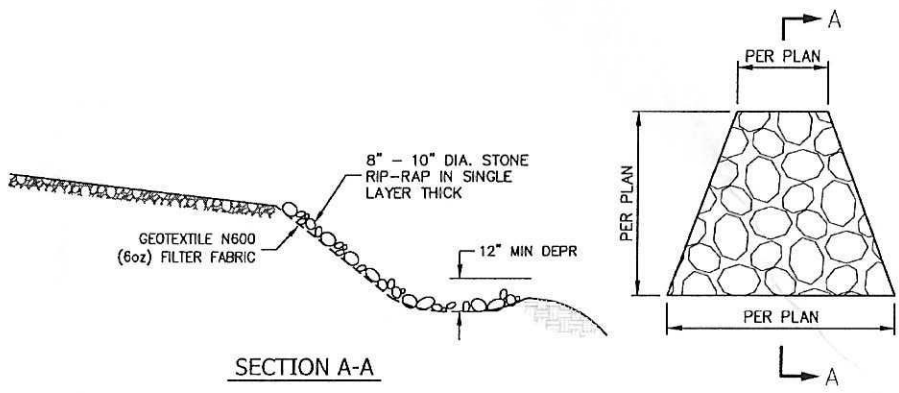
1
C3 **GRAVEL PAV'T DETAIL**
Scale: N.T.S.



2
C3 **CRASH CONCRETE PAV'T DETAIL**
Scale: N.T.S.



3
C3 **BASIN DETAIL**
Scale: N.T.S.



4
C3 **STONE RIP-RAP APRON DETAIL**
Scale: N.T.S.



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