ZONING BOARD OF APPEALS
54 MARION ROAD
Wareham, MA 02571

NOTICE OF PUBLIC HEARING

Pursuant to the authority found with M.G.L.c.40B, §20-23, Comprehensive Permit Act, the Wareham Board of Appeals will hold a public hearing **February 28, 2018** at **6:30 p.m. in Room 320 of the Wareham Multi Service Center, 48 Marion Road, Wareham, MA 02571**, to consider petition #2-18 for the construction of 174 rental dwelling units within six 3-and-4-story buildings along with a community building, open space area, and related parking. 106 of the dwelling units will be affordable housing. The property is located at **3102 Cranberry Highway**, Wareham, MA (Assessors Map 131, Lot Q1) in the CS and R-130 zoning district.

Nazih Elkallassi, Chairman

First Notice: February 8, 2018
Second Notice: February 15, 2018

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Town of Bourne
Zoning Board of Appeals
24 Perry Avenue
Buzzards Bay, MA 02532

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Town of Middleborough
Zoning Board of Appeals
20 Center Street
Middleborough, MA 02346

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Town of Plymouth
Zoning Board of Appeals
11 Lincoln Street
Plymouth, MA 02360

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Town of Caver
Zoning Board of Appeals
108 Main Street
Carver, MA 02330

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Street and
City, State,

Town of Rochester
Zoning Board of Appeals
One Constitution Way
Rochester, MA 02770

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Street a
City, St

Town of Marion
Zoning Board of Appeals
2 Spring Street
Marion, MA 02738

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Postage
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Total Postage and Fees
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Sent To
Christy's Realty Limited PTSH

Street and Apt. No., or PO Box No.
c/o Tax Dept. #32564
P.O. Box 711

City, State, ZIP+4®
Dallas, TX 75221-0711

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1264 Main Street

City, State, ZIP+4®
Waltham, MA 02451

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Sent To
Guy Marino

Street and Apt. No., or PO Box No.
Trustee of LPZ Realty Trust
44 Canterbury Drive

City, State, ZIP+4®
Plymouth, MA 02360

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Sent To
Patricia A. Moore

Street and Apt. No., or PO Box No.
P.O. Box 613

City, State, ZIP+4®
Buzzards Bay, MA 02346

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Sent To
Melissa A. Leger

Street and Apt. No., or PO Box No.
P.O. Box 677

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E. Wareham, MA 02538

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Sent To
Peter A. & Kirsten U. Coletti

Street and Apt. No., or PO Box No.
699 Plymouth Street

City, State, ZIP+4®
Middleboro, MA 02346

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Sent To
Onset Fire District

Street and Apt. No., or PO Box No.
P.O. Box 44

City, State, ZIP+4®
Onset, MA 02558

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Sent To
Linda R. Dexter of Dexter Realty Trust

Street and Apt. No., or PO Box No.
P.O. Box 1723

City, State, ZIP+4®
Onset, MA 02558

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Sent To
Frank J. Nuovo & Donald H. Angus, Trustee

Street and Apt. No., or PO Box No.
c/o Nancy Angus
P.O. Box 270

City, State, ZIP+4®
Buzzards Bay, MA 02532

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- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
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Total Postage and Fees
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Sent To
Michael Alan Hadley

Street and Apt. No., or PO Box No.
P.O. Box 282

City, State, ZIP+4®
Sagamore, MA 02561

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7017 2680 0000 2224 6731

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Postage
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Total Postage and Fees
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Sent To
Gould Wareham, LLC

Street and Apt. No., or PO Box No.
60 Cutter Mill Road
Suite 303

City, State, ZIP+4®
Great Neck, NY 11021

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1. Article Addressed to:

Peter Freeman
Freeman Law Group, LLC
86 Willow Street
Yarmouthport, MA 02675

9590 9402 4107 8092 2345 16

2. Article Number (Transfer from service label)
7018 0680 0002 1075 8157

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Onset Fire District
P.O. Box 44
Onset, MA 02558

9590 9402 3416 7227 7026 52

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6724

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Kevin E. Sampson ☐ Agent ☐ Addressee

B. Received by (Printed Name) KEVIN E SAMPSON | C. Date of Delivery 2-13-18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

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1. Article Addressed to:

Linda R. Dexter of Dexter
Realty Trust
P.O. Box 1723
Onset, MA 02558

9590 9402 3416 7227 7026 83

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6755

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Andrew J Dexter | C. Date of Delivery 2-12-18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

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1

Dakota Partners, Inc.
1264 Main Street
Waltham, MA 02451

9590 9402 3416 7227 7026 38

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6816

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

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- Print your name and address on the reverse so that we can return the card to you.
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1.

Town of Marion
Zoning Board of Appeals
2 Spring Street
Marion, MA 02738

9590 9402 3416 7227 7028 05

2.
7017 2680 0000 2224 6861

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☑ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1.

Town of Bourne
Zoning Board of Appeals
24 Perry Avenue
Buzzards Bay, MA 02532

9590 9402 3416 7227 7028 12

2.
7017 2680 0000 2224 6854

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery
2-8-17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Michael Alan Hadley
P.O. Box 282
Sagamore, MA 02561

9590 9402 3416 7227 7026 76

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6748

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Richard J. Hadley ☐ Agent ☐ Addressee

B. Received by (Printed Name) Richard J. Hadley C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

SAGAMORE MA USPS FEB - 8 2018

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Christy's Realty Limited PTSH
c/o Tax Dept. #32564
P.O. Box 711
Dallas, TX 75221-0711

9590 9402 3416 7227 7027 13

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6786

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☑ Agent ☐ Addressee

B. Received by (Printed Name) [illegible] C. Date of Delivery 2-9-18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

Restricted Delivery

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SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Town of Middleborough
Zoning Board of Appeals
20 Center Street
Middleborough, MA 02346

9590 9402 3416 7227 7028 43

2. Article Number (Transfer from service label)
7017 2680 0000 2224 6830

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Liz Gagne C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

(over $500)

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SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Town of Plymouth
Zoning Board of Appeals
~~11 Lincoln Street~~ 726 Court St.
Plymouth, MA 02360

9590 9402 3416 7227 7028 29

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6847

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Deliver

D. Is delivery address different from item 1? ☑ Yes
If YES, enter delivery address below: ☐ No

PLYMOUTH MA
FEB 08 2018

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
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☐ Signature Confirmation™
☐ Signature Confirmation Restricted De

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SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Town of Rochester
Zoning Board of Appeals
One Constitution Way
Rochester, MA 02770

9590 9402 3416 7227 7028 36

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6878

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X K Smith ☑ Agent ☐ Addressee

B. Received by *(Printed Name)* K Smith | C. Date of Deliver 2/8/17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restrict Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted De

Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receip

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SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Frank J. Nuovo & Donald H. Angus, Trustee
c/o Nancy Angus
P.O. Box 270
Buzzards Bay, MA 02532

9590 9402 3416 7227 7026 45

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6717

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☑ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Deliver 2/8/17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

BUZZARDS BAY MA
FEB - 8 2018
USPS

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restrict Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted De

Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1

Patricia A. Moore
P.O. Box 613
Buzzards Bay, MA 02346

9590 9402 3416 7227 7026 21

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6809

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Patricia A Moore ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* X PATRICIA A. MOORE C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

FEB - 8 2018

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1

Gould Wareham, LLC
60 Cutter Mill Road
Suite 303
Great Neck, NY 11021

9590 9402 3416 7227 7026 69

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6731

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

GREAT NECK NY 11021 FEB 8 2018

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

---

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1.

Guy Marino
Trustee of LPZ Realty Trust
44 Canterbury Drive
Plymouth, MA 02360

9590 9402 3416 7227 7027 06

2. Article Number *(Transfer from service label)*
7017 2680 0000 2224 6779

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1 Article Addressed to:

Peter A. & Kirsten U. Coletti
699 Plymouth Street
Middleboro, MA 02346

9590 9402 3416 7227 7027 20

2. Article Number (Transfer from service label)

7017 2680 0000 2224 6793

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery 2-8

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation
- ☐ Signature Confirmation Restricted Delivery

(over $500) estricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receip

TOWN OF WAREHAM
Board of Appeals
54 Marion Road
Wareham, MA 02571

CERTIFIED MAIL®

7017 2680 0000 2224 6762

U.S. POSTAGE PITNEY BOWES
ZIP 02571 $ 006.67⁰
02 4W
0000351046 FEB 06 2018

Melissa A. Leger
P.O. Box 677
E. Wareham, MA 02538

ANK

EAST WAREHAM MA

NIXIE 015 FE 1 0002/09/18

RETURN TO SENDER
ATTEMPTED - NOT KNOWN
UNABLE TO FORWARD

9400921369040450 ANK 02571147399 *1022-01463-06-35

FREEMAN LAW GROUP LLC

Attorneys at Law

Peter L. Freeman
pfreeman@freemanlawgroup.com
Tel. (508) 362-4700 Mobile (781) 854-2430

Kevin T. Smith, Of Counsel
ksmith@freemanlawgroup.com
Tel. (508) 362-4700 (978) 369-0634
Mobile (978) 549-3399

Renie Hamman, Paralegal, CP, ACP
rhamman@freemanlawgroup.com
Tel. (508) 362-4700

January 22, 2019

VIA FEDEX

Clerk's Office
Plymouth County Superior Court
52 Obery Street
Plymouth, MA 02360

Re: Town of Wareham, etc., v. Wareham Board of Appeals, et al.
Plymouth Superior Court C.A. No. 1883-CV-01239

Dear Sir/Madam:

I enclose herewith for filing the following:

1. Joint Stipulation of Dismissal.

Thank you for your attention to this matter.

Very truly yours,

Peter L. Freeman

PLF:ecc
Enclosures
cc: Richard Bowen, Esq.
Wareham Zoning Board of Appeals

COMMONWEALTH OF MASSACHUSETTS

PLYMOUTH, SS.

SUPERIOR COURT DEPT.
NO. 1883CV01239

TOWN OF WAREHAM, by and through its BOARD OF SELECTMEN,

Plaintiff

v.

WAREHAM BOARD OF APPEALS, consisting of its members, and DAKOTA PARTNERS, INC.,

Defendants

JOINT STIPULATION OF DISMISSAL

Now come all of the parties who have appeared in the instant action and by and through their counsel hereby stipulate, pursuant to Mass.R.Civ.P.41(a)(1)(ii), to dismiss the instant action, *with prejudice,* with all rights of appeal waived and with each party to bear its own costs.

WHEREFORE, the parties respectfully respect that this Honorable Court enter this stipulation of dismissal on the docket, forthwith, with all rights of appeal waived and with each party to bear its own costs.

Dated: January 21, 2019

PLAINTIFF
TOWN OFWAREHAM

By its Attorney,

Richard Bowen BF

Richard Bowen (BBO#552814)
28 Stockbridge Road
Scituate, MA 02066
Tel: 781-733-7178

Respectfully submitted,

DEFENDANT
DAKOTA PARTNERS, INC.

By its Attorney,

Peter L. Freeman (BBO#179140)
Ilana M. Quirk (BBO#409850)
Freeman Law Group LLC
86 Willow Street – Unit 6
Yarmouthport, MA 02675
Tel: 508-362-4700
pfreeman@freemanlawgroup.com
iquirk@freemanlawgroup.com

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Mobile (978) 549-3399

Renie Hamman, Paralegal, CP, ACP
rhamman@freemanlawgroup.com
Tel. (508) 362-4700

December 19, 2018

Clerk's Office
Plymouth County Superior Court
52 Obery Street
Plymouth, MA 02360

Re: Town of Wareham, etc., v. Wareham Board of Appeals, et al.
Plymouth Superior Court C.A. No. 1883-CV-01239

Dear Sir/Madam:

I enclose herewith for filing the following:

1. Answer of Defendant Dakota Partners, Inc. to Plaintiff's First Amended Complaint
2. Certificate of Service

Thank you for your attention to this matter.

Very truly yours,

Peter L. Freeman

PLF:ecc
Enclosures
cc: Richard Bowen, Esq.
Wareham Zoning Board of Appeals

COMMONWEALTH OF MASSACHUSETTS

PLYMOUTH, SS. SUPERIOR COURT DEPT.
NO. 1883CV01239

TOWN OF WAREHAM, by and through its BOARD OF SELECTMEN,

Plaintiff

v.

WAREHAM BOARD OF APPEALS, consisting of its members, and DAKOTA PARTNERS, INC.,

Defendants

ANSWER OF DEFENDANT DAKOTA PARTNERS, INC. TO PLAINTIFF'S FIRST AMENDED COMPLAINT

Now comes Defendant Dakota Partners, Inc. ("Dakota") and answers and responds to the First Amended Complaint of Plaintiff Town of Wareham, by and through its Board of Selectmen ("Board of Selectmen"), as follows:

The initial unnumbered paragraph (labeled "First Amended Complaint" and "Introduction)" sets forth no factual averments and recites conclusions of law, to which no response is required. Responding further, Dakota states that G.L. c.40B, §21, and G.L. c.40A, §17 speak for themselves.

1. Admitted.

2. Admitted.

3-8. Dakota is without knowledge or information sufficient to form a belief as to the truth of the averments set forth in these paragraph and calls upon the Board of Selectmen to prove same.

9. Admitted.

10. Admitted.

11. Admitted that the Wareham Zoning Board of Appeals ("ZBA") held a public hearing on Dakota's application for a comprehensive permit for property at 3102 Cranberry Highway ("Property") and that the ZBA issued a decision granting Dakota a comprehensive permit on October 24, 2018 ("Comprehensive Permit"). Responding further, Dakota states that the ZBA's administrative record, in its entirety, regarding the Comprehensive Permit, speaks for itself. Any remaining averments are denied.

12. Admitted that the ZBA filed its decision to grant the Comprehensive Permit with the Wareham Town Clerk on October 25, 2018. Exhibit A speaks for itself. The Comprehensive Permit speaks for itself. Any remaining averments are denied.

13. Admitted that the Comprehensive Permit granted Dakota relief for the Property. Responding further, the Comprehensive Permit speaks for itself. Admitted that the Property abuts a numbered state highway. The averment set forth in this paragraph, that the highway is a "busy state highway," is not comprehensible; and, so, Dakota is without knowledge or information sufficient to form a belief as to the truth of this averment and calls upon the Board of Selectmen to prove same. Responding further, Dakota states that, as recited in the Comprehensive Permit, Dakota presented a traffic impact study to the ZBA during the public hearing and the ZBA had the study peer reviewed, all at Dakota's expense; and the ZBA

concluded that it had no jurisdiction over impacts to the state highway and that MassDOT would handle those aspects.

14. Denied that the Comprehensive Permit is "inconsistent with local concerns and needs" and denied that the Board of Selectmen is "aggrieved" by the Comprehensive Permit. Answering further, G.L. c.40B, §§21-23 and the regulations promulgated thereunder speak for themselves. Any remaining averments are denied.

15. Denied that the Board of Selectmen presented "local concerns" regarding the proposed project to the ZBA during the public hearing. Exhibit B speaks for itself. Responding further, Dakota states that, as set forth in Amended Complaint Exhibit B, the Board of Selectmen noted only to the ZBA that: "It should go without saying … [that the proposed project] would have enormous impacts" and the Board of Selectmen never identified a single specific local concern within the meaning of G.L. c.40B to the ZBA regarding the project. Any remaining averments are denied.

16. Denied.

17. Denied.

18. Denied that the project allowed under the Comprehensive Permit is "grotesquely out of scale density-wise." Dakota is without knowledge or information sufficient to form a belief as to the truth of the remaining averments, regarding how the proposed project compares to other comprehensive permit projects previously approved in the Town of Wareham, and calls upon the Board of Selectmen to prove same.

19. Denied that the ZBA "failed to require common-sense security measures" in the Comprehensive Permit. Dakota is without knowledge or information sufficient to form a belief

regarding the truth of the remaining averments and calls upon the Board of Selectmen to prove same.

20. Denied that the ZBA "failed to adequately protect public water supply (sic)" in the Comprehensive Permit.

21. Denied that the ZBA "failed to require applicant to provide environmental insurance" to protect the water supply, as there is no such requirement or duty.

22. The plan for the project speaks for itself and any remaining averments are denied.

23. Denied that the ZBA "wholly ignored negative traffic impacts" on local roads. Denied that the ZBA "failed" in its duty under G.L. c.40B by not requiring Dakota to obtain input or sign offs from MassDOT regarding impacts on the adjacent numbered highway as there was no such duty by the ZBA and MassDOT is exercising and will continue exercise its separate jurisdiction as appropriate regarding planned improvements to the highway.

24. Denied.

25. Denied.

26. Denied.

27. Dakota is without knowledge or information to a belief as the truth of the averments in this paragraph and calls upon the Board of Selectmen to prove same.

28. Denied.

29. Denied that the Comprehensive Permit is flawed due to a lack of site control by Dakota over the Property or for any other reason. Responding further, Dakota notes that it is the Subsidizing Agency who determines whether sufficient site control by a developer exists and that, when and if, at some future point, additional corporate entities are created in order to undertake specific phases of the project, those entities will be required to have site control as

provided for under G.L. c.40B and as required by the Subsidizing Agency, but there is no such requirement now.

30. Admitted that the ZBA approved the Comprehensive Permit based upon Dakota's site control of the Property, as determined by the Subsidizing Agency.

31. Denied.

32. Denied.

33. Denied.

FIRST DEFENSE

The First Amended Complaint must be dismissed for lack of subject matter jurisdiction, under Mass.R.Civ.P. 12(b)(1), as the instant action is time barred because the Comprehensive Permit was filed by the ZBA with the Wareham Town Clerk on October 25, 2018 and the initial complaint in this action was not timely filed with this Honorable Court, with notice to the Town Clerk, as expressly required under G.L. c.40A, §17, within 20 days of the October 25, 2018 date (i.e., on or before November 14, 2018). See copy of Town Clerk's Certification of No Appeal attached hereto as Exhibit A and incorporated herein by reference.

SECOND DEFENSE

The First Amended Complaint must be dismissed for lack of subject matter jurisdiction, under Mass.R.Civ.P. 12(b)(1), as Plaintiff Town of Wareham, by and through its Board of Selectmen, lacks the requisite standing to maintain this action as the complaint identifies no harm to the Town that is cognizable under G.L. c.40B and asserts no facts that would create a presumption of aggrievement.

THIRD DEFENSE

The First Amended Complaint must be dismissed, under Mass.R.Civ.P. 12(b)(6), for failure to state a claim upon which relief may be granted as no facts have been averred that support a claim cognizable under either G.L.c.40A, §17 or G.L.c.40B, §21 or any other theory.

WHEREFORE, Defendant Dakota Partners, Inc. requests that this Honorable Court:

1. Dismiss the First Amended Complaint in its entirety;
2. Enter Judgment enter in favor of Dakota Partners, Inc. and the ZBA;
3. Award Dakota Partners Inc. its costs of litigation and reasonable attorneys' fees, after entry of judgment, under G.L. c.231, §6F and G.L. c.40A, §17, against Plaintiff Town of Wareham as the instant action is brought in bad faith by the Town; and
4. Enter such other relief as the Court determines is just and equitable.

Dated: December 19, 2018

Respectfully submitted,

DEFENDANT
DAKOTA PARTNERS, INC.,

By its Attorneys,

Peter L. Freeman Ilana M. Quirk BF

Peter L. Freeman (BBO 179140)
Ilana M. Quirk (BBO#409850)
Freeman Law Group LLC
86 Willow Street – Unit 6
Yarmouthport, MA 02675
Tel: 508-362-4700
Fax: 508-362-4701
pfreeman@freemanlawgroup.com
iquirk@freemanlawgroup.com

Exhibit A

TOWN OF WAREHAM

Zoning Board of Appeals
54 Marion Road
Wareham, MA 02571

DECISION ON APPLICATION FOR COMPREHENSIVE PERMIT
G.L. c. 40B, §§ 20-23

APPLICANT:	DAKOTA PARTNERS, INC. ("Applicant")
PROPERTY:	3102 Cranberry Highway, Wareham (the "Property")
ASSESSORS' MAP:	Map 131, Parcel Q1
DEVELOPMENT NAME:	Woodland Cove Apartments
DATE:	October 24, 2018

I. PROCEDURAL HISTORY

1. An application for a Comprehensive Permit was received by the Town of Wareham Zoning Board of Appeals ("Board") on or about January 31, 2018 ("Application"). The Application proposes the development of one hundred and seventy-four (174) rental apartment units within six (6) residential structures, located at 3102 Cranberry Highway, Wareham, Massachusetts ("Project").

2. The Board's public hearing on the Application was duly opened on February 28, 2018, and was continued to March 21, April 11, April 25, May 9, June 13, June 27, July 25, August 8, August 22, September 12, and September 26, all in the year 2018. The public hearing was closed on September 26, 2018.

3. The Project is located on the Property, which is located at 3102 Cranberry Highway, Wareham, Massachusetts.

4. The Property is located in the Strip Commercial (CS) and the Residence 130 (R-130) Zoning District. Nearby uses consist of mainly commercial uses along Cranberry Highway, and residential uses along Red Brook Road. The Property currently contains an existing motel, which is proposed to be demolished.

5. The Applicant provided various materials, reports, studies, and revised plans throughout the course of the public hearing on the Application.

I hereby certify that 20 days have elapsed after the decision was filed in the office of the Town Clerk of Wareham and no appeal has been filed in accordance with Section 17, Chapter 40 A of the Massachusetts General Laws.

20 Days Has Elapsed MAS

Town Clerk

A TRUE COPY
ATTEST
TOWN CLERK

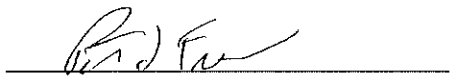
CERTIFICATE OF SERVICE

I, Peter L. Freeman, Esq., hereby certify that I served a copy of the within Answer of Defendant Dakota Partners, Inc. by First Class Mail, Postage Pre-Paid on December 19, 2018 upon counsel for Plaintiff Town of Wareham, by and through its Board of Selectmen, and upon the Wareham Zoning Board of Appeals as follows:

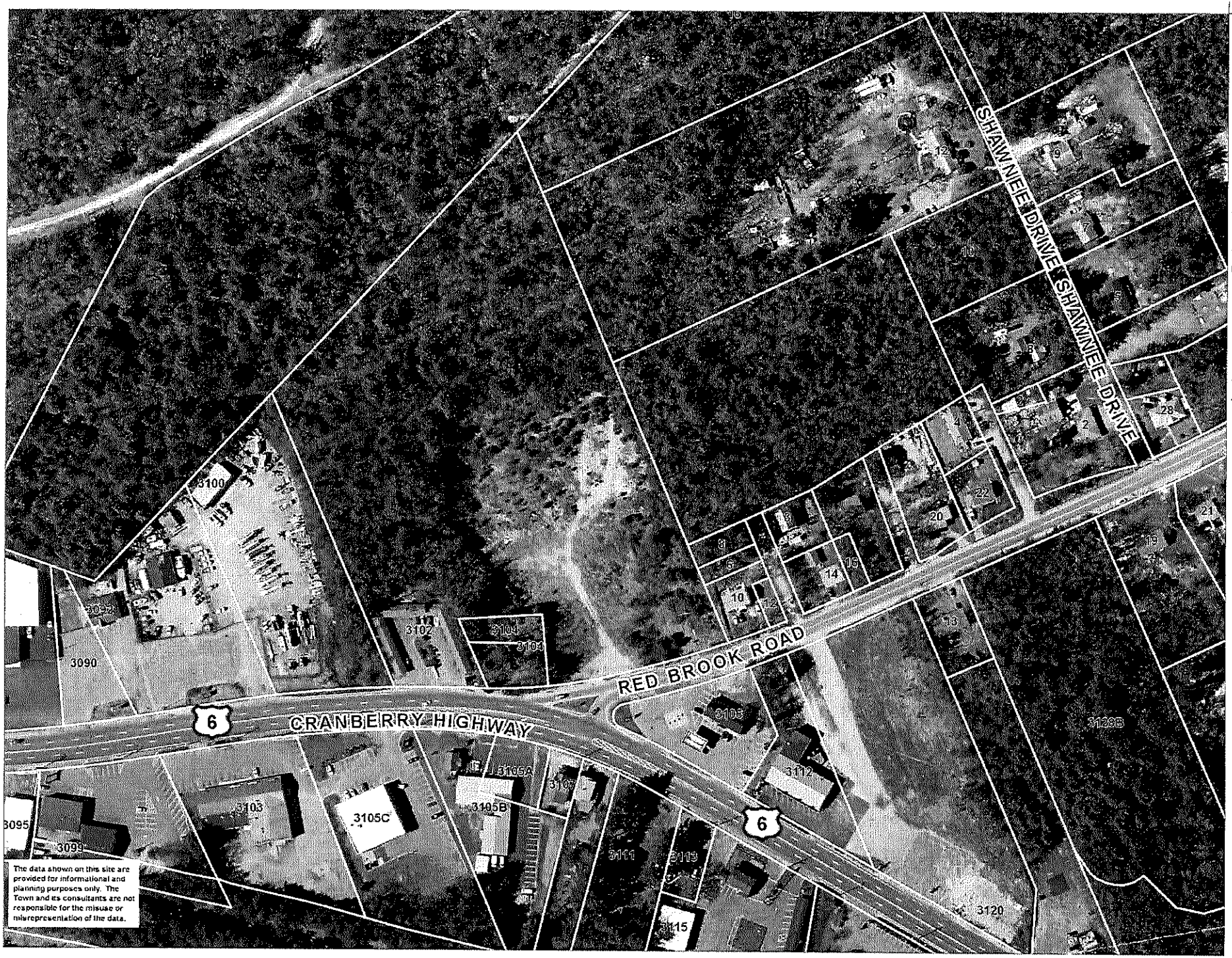
Richard Bowen, Esq.
28 Stockbridge Road
Scituate, MA 02066

and

Wareham Zoning Board of Appeals
Wareham Town Hall
54 Marion Road
Wareham, MA 02571



Peter L. Freeman, Esq.



0 280 560 ft

Printed on 05/09/2017 at 05:50 PM

Property Location: 3102 CRAN HWY | MAP ID: 131/ / Q1/ / | Bldg Name: | State Use: 112C

Vision ID: 13859 | Account # | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 08/13/2018 11:54

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	14		Apartments
Model	94		Commercial
Grade	04		Ave
Stories	1		
Occupancy	15		
Exterior Wall 1	14		Wood Shingle
Exterior Wall 2			
Roof Structure	03		Gable/Hip
Roof Cover	03		Asphalt Shing
Interior Wall 1	05		Drywall
Interior Wall 2			
Interior Floor 1	14		Carpet
Interior Floor 2			
Heating Fuel	03		Gas
Heating Type	05		Hot Water
AC Type	01		None
Bldg Use	3010		MOTELS
Total Rooms			
Total Bedrms	00		
Total Baths	16		
Heat/AC	00		NONE
Frame Type	02		WOOD FRAME
Baths/Plumbing	02		AVERAGE
Ceiling/Wall	06		CEIL & WALLS
Rooms/Prtns	03		ABOVE AVERAGE
Wall Height	8		
% Comn Wall	0		

CONSTRUCTION DETAIL (CONTINUED)

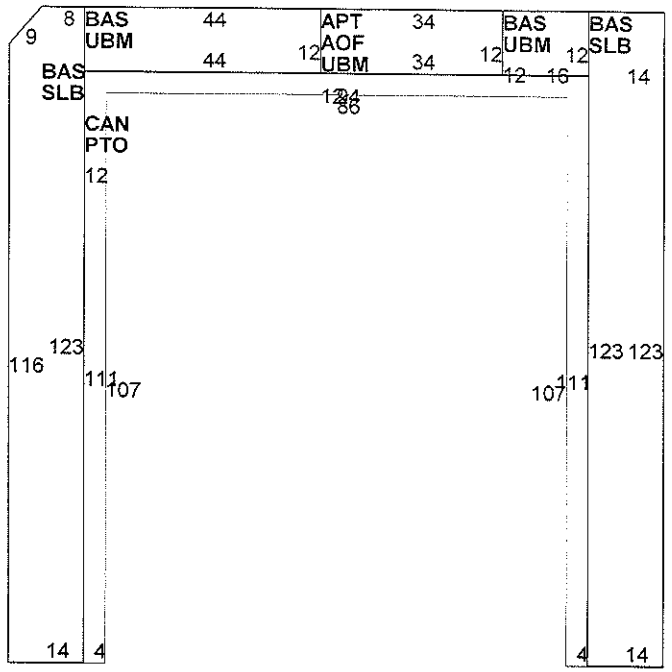
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
112C	APT OVER 8 MDL-94	100

COST/MARKET VALUATION

Adj. Base Rate:	90.03
Replace Cost	499,576
AYB	1960
EYB	1975
Dep Code	F
Remodel Rating	
Year Remodeled	
Dep %	42
Functional Obslnc	0
External Obslnc	0
Cost Trend Factor	1
Condition	
% Complete	
Overall % Cond	58
Apprais Val	289,800
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

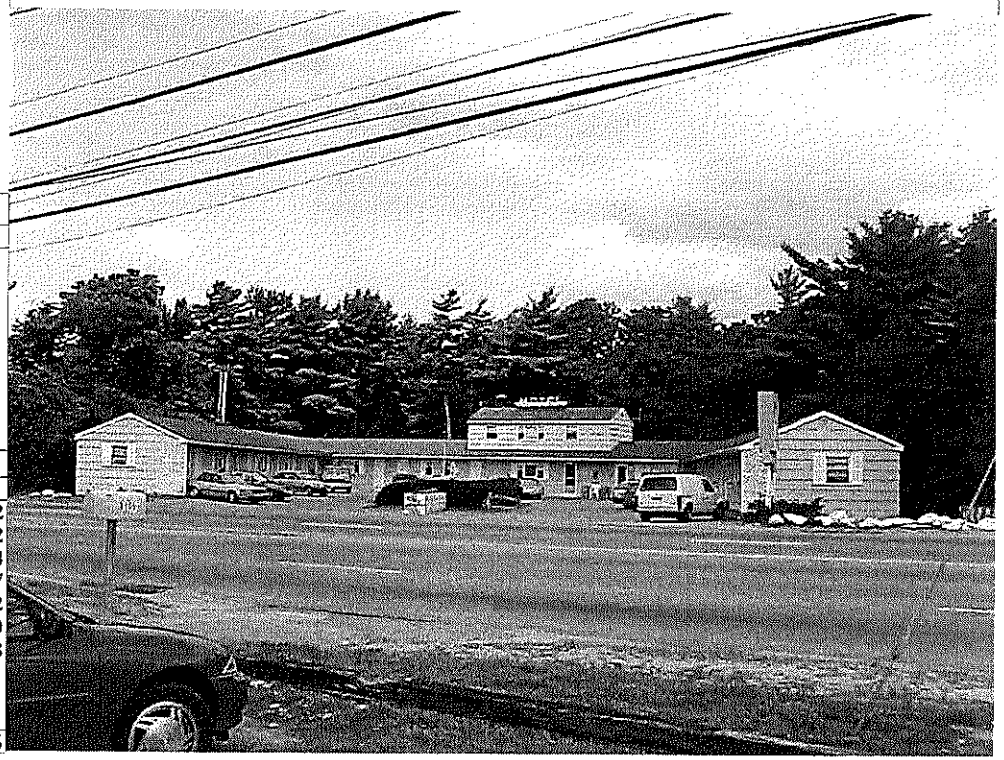


OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
PAV1	PAVING-ASPI			L	5,000	2.50	1995		0		50	6,300
SGN3	W/INT LIGHT			L	36	75.00	1995		0		50	1,400

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
AOF	Office, (Avg)	408	408			36,732
APT	Apartment	408	408			36,732
BAS	First Floor	4,143	4,143			372,994
CAN	Canopy	0	1,232			22,147
PTO	Patio	0	1,232			5,582
SLB	Slab Fndtn	0	3,423			0
UBM	Basement Unfin	0	1,128			25,388
	Ttl. Gross Liv/Lease Area:	4,959	11,974			499,576



Woodland Cove Income and Rental Schedule

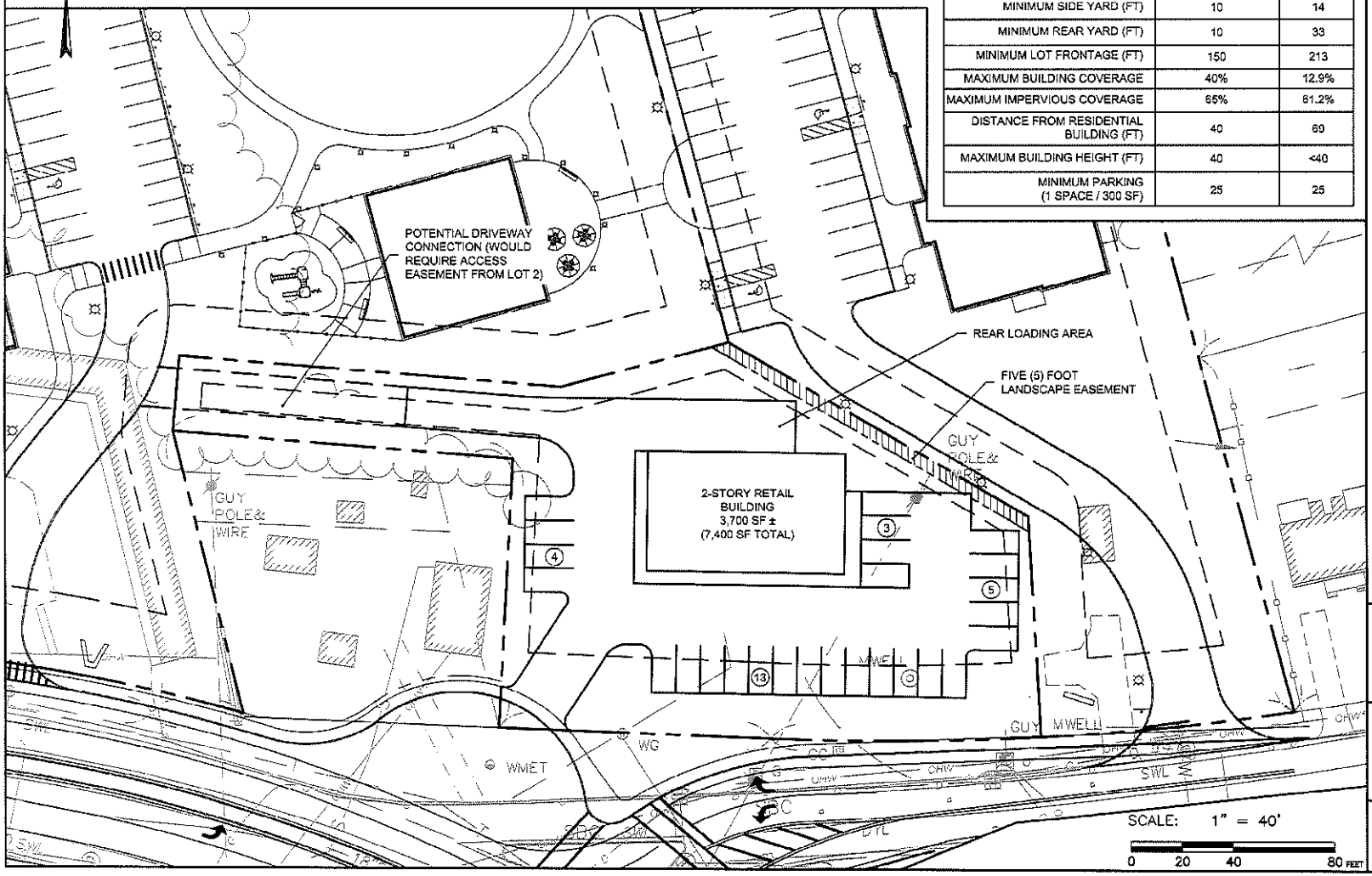
		1 Bedroom	2-Bedroom	3-Bedroom	Total Units	PEL Letter Defined Units
	Number of Units: (per PEL)	32	122	20	174	
	Max Income @ (30% AMI)	$ 24,279.00	$ 29,130.00	$ 33,645.00		
	Maximum Rent*	$ 555.00	$ 657.00	$ 760.00		
Qnty:		2	10	2	14	
	Maximum Income @ (60% AMI)	$ 48,540.00	$ 58,260.00	$ 67,290.00		
	Maximum Rent*	$ 1,162.00	$ 1,385.00	$ 1,601.00		
Qnty:		18	64	10	92	106
	Market Rate Units	$ 1,243.00	$ 1,447.00	$ 1,720.00		
Qnty:		12	48	8	68	
	Totals (174 Units):	32	122	20	174	

* - Landlord Pays Heat and Hot Water

LOT 4 Option	Lot 4 31,145 Sq. Ft. Lot	Yields 7,400 Sq. Ft. Commercial Bldg Yields 25 Spots at 1,243 Sq. Ft. Per Spot
(3) Phases	Remaining Lots 344,941 Sq. Ft. Lot	Yields 82,128 Sq. Ft. Commercial Bldg Yields 277 Spots at 1,245 Sq. Ft. Per Spot

ZONING TABLE

	COMMERCIAL STRIP (USE: RETAIL)	LOT 4 OPTION 2
MINIMUM LOT AREA (SF)	30,000	31,145±
MINIMUM FRONT YARD (FT)	20	84
MINIMUM SIDE YARD (FT)	10	14
MINIMUM REAR YARD (FT)	10	33
MINIMUM LOT FRONTAGE (FT)	150	213
MAXIMUM BUILDING COVERAGE	40%	12.9%
MAXIMUM IMPERVIOUS COVERAGE	65%	61.2%
DISTANCE FROM RESIDENTIAL BUILDING (FT)	40	69
MAXIMUM BUILDING HEIGHT (FT)	40	<40
MINIMUM PARKING (1 SPACE / 300 SF)	25	25



3102 CRANBERRY HIGHWAY LOT SUBDIVISION

IN

WAREHAM
MASSACHUSETTS

CONCEPTUAL SITE PLAN - LOT 4 OPTION 2

PREPARED FOR:

DAKOTA PARTNERS
1264 MAIN STREET
WALTHAM, MA 02451

BSC GROUP
803 Summer Street
Boston, Massachusetts 02127-1601
860 652 8227

Job No.: 53669.00 Date: 12-22-2017
Scale: 1" = 40' Revised:
Dwg No: CONCEPT 2
File:

Dakota Partners – Parking Analysis

Operating Properties 5/7/18

Capitol Lofts – 390 Capitol Ave, Hartford, CT 06106

112 Units

.96 parking ratio

Tenney Place, Phase I – 505 W Lowell Ave, Haverhill, MA 01832

72 Units

1.4 parking ratio

Laurel Hill – 50 Laurel Hill Rd, Brookfield, CT 06804

72 Units
1.1 parking ratio

Barton House – 34 East St, New Milford, CT 06776

38 Units

.82 parking ratio

Village Green, Phase I & II – 767 Independence Dr, Barnstable, MA 02601

120 Units

1.4 parking ratio

Kensington Woods – 3 Kensington Ln, Bedford, NH 03110

41 Units
1.1 parking ratio

Pine Valley Lofts – 37 Wilton Rd, Milford, NH 03055

50 Units

1.08 parking ratio

TO VERIFY AUTHENTICITY, SEE REVERSE SIDE FOR DESCRIPTION OF THE 11 SECURITY FEATURES

VOID VOID VOID

MultiCHAX® # 25423DNS-08

DPI, LLC
1264 Main Street
Waltham, MA 02451

Rockland Trust
288 Union Street
Rockland, MA 02370
53-447/113 474

CHECK NO. 1941

01/26/2018

VOID VOID VOID

Town of Wareham **1,000.00

One Thousand and 00/100**********

PAY
TO THE
ORDER
OF

Town of Wareham

VOID VOID VOID

AUTHORIZED SIGNATURE

WC Filing Fee

⑈001941⑈ ⑆011304478⑆ 247400091 2⑈

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DPI, LLC
1264 Main Street
Waltham, MA 02451

Rockland Trust
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Rockland, MA 02370
53-447/113 474

MultiCHAX® # 25423DNS-08

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01/26/2018

Town of Wareham
Five Thousand and 00/100**********

****5,000.00**

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Town of Wareham

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WC - Technical Review Fee

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⑈001943⑈ ⑆011304478⑆ 247400912⑈

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DPI, LLC
1264 Main Street
Waltham, MA 02451

Rockland Trust
288 Union Street
Rockland. MA 02370
53-447/113 474

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02/07/2018

Wareham Week

****80.00**

Eighty and 00/100**********

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Wareham Legal Advertisement

⑈001952⑈ ⑆011304478⑆ 247400912⑈

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MultiCHAX® # 25423DNS-08

VOID VOID VOID

DPI, LLC
1264 Main Street
Waltham, MA 02451

Rockland Trust
288 Union Street
Rockland. MA 02370
53-447/113 474

CHECK NO. 1951

02/07/2018

Town of Wareham

****82.74**

Eighty-Two and 74/100**********

PAY TO THE ORDER OF: Town of Wareham

VOID VOID VOID

AUTHORIZED SIGNATURE

Abutter Notification Mailing Fee

⑈001951⑈ ⑆011304478⑆ 247400912⑈

Town of Wareham
Zoning Board of Appeals

54 Marion Road
Wareham, MA 02571-1428

Phone: (508) 291-3100 x6501
Fax: (508) 291-3116
Email: kbuckland@wareham.ma.us

Ken Buckland, Town Planner
Jasmin Campos, Dept. Assistant

February 1, 2018

Dear Selectmen,

Please review the attached 40B application and plans. If plans are not included in your packet they are available for review at the Planning Department. Dakota Partners are proposing to construct six 3-and-4-story buildings which will contain in total 174 rental dwelling units. Of these 174 rental dwelling units, 106 units will be affordable housing. The project is located at 3102 Cranberry Highway. Please forward comments to our department. Thank you.

Jasmin Campos, Department Assistant

508-291-3100 ext. 6500
jcampos@wareham.ma.us

cc: Fire Department
Police Department
Water Department
Health Department
Building Department
EMS
Municipal Maintenance
Charles Rowley
Conservation Commission

TOWN OF WAREHAM
ZONING BOARD OF APPEALS

REQUEST FOR EXTENSION/CONTINUANCE

Applicant: Dakota Partners, Inc. (the "Applicant")
Date: 9-12-18
Property Address: Cranberry Highway (the "Property")
Application Type: Special Permit; Variance, Comprehensive Permit (c. 40B), Zoning Appeal, Other (circle one) (the "Application)

The Applicant hereby requests (check all that apply):

☐ Extension of the time to open a hearing on the Application to _____.

☑ Continuance of the hearing on the Application to Sept. 26, 2018.

☑ Extension of the allowed duration of the hearing on the Application to Oct 2, 2018.

☐ Extension of the time to make a decision on the Application to _____.
40 days after close of hearing

The Applicant:

By: _____, duly authorized
Peter L. Freeman Attorney in fact

To: Paul Haverty <paul@bbhlaw.net>; 'Kenneth Buckland' <kbuckland@wareham.ma.us>
Cc: Jasmin Campos <JCampos@wareham.ma.us>; Derek Sullivan <dsullivan@wareham.ma.us>; Peter Freeman <pfreeman@freemanlawgroup.com>
Subject: Woodland Cove - Draft Decision and Waiver List

Hi Paul and Ken

Attached please find the draft Decision for the Woodland Cove Project as drafted by Paul with our proposed revisions/comments in track redlined changes.
I will be happy to provide a cleaned version of this if you would like.
I am also attaching the list of the Waivers for the attachment to the Decision.

Ken, please let us know how many copies of you would like us to bring to the hearing tomorrow night.

Thanks!

Renie Hamman, Paralegal
Freeman Law Group LLC
86 Willow Street
Yarmouth Port, MA 02675
(508) 362-4700
rhamman@freemanlawgroup.com

Woodland Cove - Draft Decision and Waiver List

Kenneth Buckland

Wed 8/29/2018 6:24 PM

To:ZBA <ZBA@wareham.ma.us>;

Cc:paul@bbhlaw.net <paul@bbhlaw.net>; Peter Freeman <pfreeman@freemanlawgroup.com>; Renie Hamman <rhamman@freemanlawgroup.com>; Jasmin Campos <JCampos@wareham.ma.us>; Richard Bowen <richbowen1@hotmail.com>; BOS <bos@wareham.ma.us>;

2 attachments

Conditions of Appproval Draft 8.1.18 (PJH revisions).doc; DECISION DRAFT-FROM HAVERTY-07-26-18-REDLINED PLF-08-21-18 (PJH revisions 8-22-18).docx;

Rather than walk through each condition and line item in your deliberations at the meeting on September 12, please identify the conditions (and waivers) that you disagree with and want changed and how, and conditions or waivers you want added, or want eliminated. I will collect and sort them. If there is a difference of opinion, these can be individually voted up or down during the deliberations - *but remember that any and all discussion and comments between Board members on content will only take place at the upcoming meeting and not by email.*

The ZBA Chairman has given me a list of conditions he wants included in the decision:
1. Modify condition E.27 to add that 'all pathways shall be paved with bituminous concrete/asphalt'
2. Add a condition that a driveway with 4 parking spaces at the building shall be constructed from the project driveway to the community building
3. Modify Condition E. 25 to add - A bond, in a form and amount acceptable to the ZBA for construction of the community building, shall be submitted and approved by the ZBA before construction begins on Phase I.

I also recommend adding:
1. Modify Condition J. 11 to add that the Community Building shall also include a computer lab/room, an indoor children's activity room, and tables and chairs available for use in the community room.
2. Add a condition that Wi-Fi [wireless internet communications] shall be provided in all buildings.
3. Change 'Town Planner,' to 'Director of Planning and Community Development' throughout
4. Add to condition E.1. "and Town staff and consultants"
5. Add - No waivers from the Wareham Zoning By-Laws regarding signage shall be granted by this decision.
6. Add to condition J.12 Bus shelter shall be 6'Dx12'W in size.

Please submit your requests as soon as possible - *but remember that any and all discussion and comments between Board members on content will only take place at the upcoming meeting and not by email.*

RECEIVED
1115 am
AUG 27 2018 JD
TOWN OF WAREHAM
TOWN CLERK

TOWN OF WAREHAM
ZONING BOARD OF APPEALS

REQUEST FOR EXTENSION/CONTINUANCE

Applicant: Dakota Partners, Inc (the "Applicant")
Date: 8-22-18
Property Address: 3102 Cranberry Hwy (the "Property")
Application Type: Special Permit; Variance, Comprehensive Permit (c. 40B), Zoning Appeal, Other (circle one) (the "Application)

The Applicant hereby requests (check all that apply):

☐ Extension of the time to open a hearing on the Application to _____.

☐ Continuance of the hearing on the Application to _____.

☑ Extension of the allowed duration of the hearing on the Application to Sept 19, 2018.

☑ Extension of the time to make a decision on the Application to Sept 19, 2018

The Applicant:

By: _____, duly authorized
Peter L Freeman

Kenneth Buckland
Director of Planning and Community Development
Town of Wareham
508.291.3100 x 6501

From: Paul Haverty <paul@bbhlaw.net>
Sent: Wednesday, August 22, 2018 1:58 PM
To: Kenneth Buckland
Subject: RE: Woodland Cove - Draft Decision and Waiver List

Ken,

Attached please find a revised decision that accepts all of the proposed changes that were either minor grammatical corrections, or were minor non-substantive changes. This document is cleaner and should be easier to follow. I have also attached a modified version of your August 1, 2018 list of proposed conditions, which tracks the conditions that do not appear to have been included in the most recent draft.

Regards,

Paul

Paul J. Haverty
Blatman, Bobrowski & Haverty, LLC
9 Damonmill Square, Suite 4A4
Concord, MA 01742

(978) 371-2226 (telephone)
(978) 371-2296 (facsimile)

From: Kenneth Buckland <kbuckland@wareham.ma.us>
Sent: Wednesday, August 22, 2018 10:35 AM
To: Paul Haverty <paul@bbhlaw.net>; Renie Hamman <rhamman@freemanlawgroup.com>
Cc: Jasmin Campos <JCampos@wareham.ma.us>; Derek Sullivan <dsullivan@wareham.ma.us>; Peter Freeman <pfreeman@freemanlawgroup.com>
Subject: Re: Woodland Cove - Draft Decision and Waiver List

Renie,

12 copies of the draft decision.

Also have Peter bring a letter for extension of time for the public hearing.

Thanks

Kenneth Buckland
Director of Planning and Community Development
Town of Wareham
508.291.3100 x 6501

From: Paul Haverty <paul@bbhlaw.net>
Sent: Wednesday, August 22, 2018 9:56 AM
To: Renie Hamman; Kenneth Buckland
Cc: Jasmin Campos; Derek Sullivan; Peter Freeman
Subject: RE: Woodland Cove - Draft Decision and Waiver List

Renie,

I have received the proposed draft decision. I will leave it to Ken to let you know how many copies you should bring.

Regards,

Paul

Paul J. Haverty
Blatman, Bobrowski & Haverty, LLC
9 Damonmill Square, Suite 4A4
Concord, MA 01742

(978) 371-2226 (telephone)
(978) 371-2296 (facsimile)

From: Renie Hamman <rhamman@freemanlawgroup.com>
Sent: Wednesday, August 22, 2018 9:52 AM
To: Paul Haverty <paul@bbhlaw.net>; Kenneth Buckland <kbuckland@wareham.ma.us>
Cc: Jasmin Campos <JCampos@wareham.ma.us>; Derek Sullivan <dsullivan@wareham.ma.us>; Peter Freeman <pfreeman@freemanlawgroup.com>
Subject: FW: Woodland Cove - Draft Decision and Waiver List

Hi Paul and Ken

Could you please confirm that you received this redlined draft decision and list of waivers. And please let us know how many copies you would like to bring tonight.

Thanks!

Renie Hamman, Paralegal
Freeman Law Group LLC
86 Willow Street
Yarmouth Port, MA 02675
(508) 362-4700
rhamman@freemanlawgroup.com

From: Renie Hamman
Sent: Tuesday, August 21, 2018 12:06 PM

Yarmouth Commons
MASSACHUSETTS

Project Description

Yarmouth Commons – South Yarmouth, Massachusetts

Dakota Partners Yarmouth Commons project is located at 881 Route 28 in South Yarmouth, Massachusetts. The proposed development will consist of three residential buildings, an expansive common green space, fitness center, leasing office, playground, and community center. Two of the residential buildings will be two stories in height, one with 19 residential units and the other with 20 units. The third residential building will be three stories in height with 30 units.

The apartments will feature open concept floor plans, spacious bedrooms, and modern kitchens with Energy Star appliances. Units will also have a heat-recovery ventilator (HRV) unit that will provide continuous fresh air while also enhancing energy efficiency.

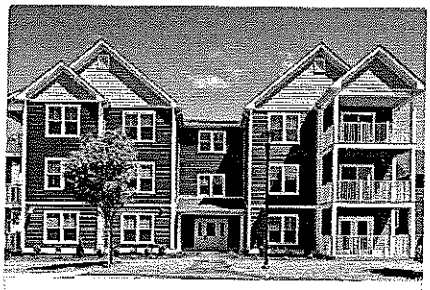
Yarmouth Commons is located in an attractive suburban setting with convenient access to Route 28 and Route 6 and to the cities of Hyannis and Barnstable. Many amenities can also be found within a short drive of the apartments.

Construction is anticipated to begin in the spring of 2018. Yarmouth Commons will welcome its first residents at the end of 2018 and will be managed by HallKeen Management. Total development costs are estimated at $22 million.

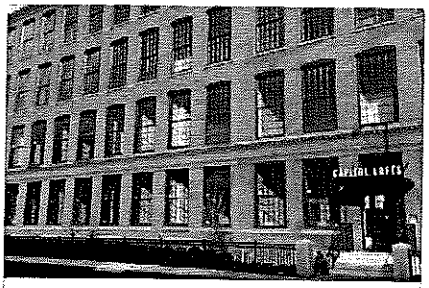
Details:

17 one bedrooms
44 two bedrooms
8 three bedrooms

Recent Projects



Brook Hill Village
CONNECTICUT



Capitol Lofts
CONNECTICUT

Kensington Woods
NEW HAMPSHIRE

1264 Main Street | Waltham, MA 02451 | Tel: 781.899.4002

PAUL HAVERTY PHONE CALL

USE OWN CONSULTANTS

NOTES FROM NAZIH

1. MOTEL - DEMOLISHED + VACATED IN PHASE I

2. BUILT OVER 6 YEARS
3. INFRASTRUCTURE
4. COMMUNITY CENTER + OPEN SPACE IN PHASE 1
5. ROAD WIDTH
6. RT ONLY ON STATE HWY DOT ISSUE
7. FENCING FOR PHASES
8. STOP SIGNAGE
9. ALL CB's OIL WATER SEPARATOR
10. SIDEWALKS ADA
11. LANDSCAPE CONTRACTOR W/ MAINTENANCE + ORGANIC
12. SEWER MH W/ FLOOD PROTECTION TYPE
13. FENCING AROUND PERIMETER
14. MASS DOT CURB CUT
15. SEWER DEPT. TO INSTALL DEVICE FOR FLOW MONITORING - REMOTE SENSING
16. CROSSWALK W/ PEDESTRIAN LIGHT/SIGNAL
17. BEST EFFORTS TO USE LOCAL CONTRACTORS

? EQUIVALENT DWELLING UNIT FOR MF UNITS SEWAGE FLOW

BSC GROUP

TRANSMITTAL

803 SUMMER STREET, BOSTON, MA 02127 - www.bscgroup.com
TEL 617-896-4300 - 800-288-8123

To: Mr. Kenneth Buckland
Town Planner
Wareham Memorial Town Hall
54 Marion Road
Wareham, Massachusetts 02571

Date: August 22, 2018
Proj. No.: 83669.00
Project: Woodland Cove

We are sending you:

☒ Attached ☐ Under Separate Cover

Via:

Delivery Tracking No.: _____

☐ Overnight Delivery ☐ Picked Up By Recipient ☐ Regular Mail ☐ Taxi
☐ Messenger ☐ Direct From Printer ☒ Other: Hand Delivered at Meeting

The following item(s):

☐ Change Order ☐ Drawings ☐ Prints ☐ Samples
☐ Copy of Letter ☐ Photocopies ☐ Reports ☐ Specifications
☐ Digital Media ☐ Plans ☒ Other: Draft Decision and Waivers

No. of Copies	Drawing No.	Date or Revision	Description
14	n/a	n/a	Redlined Draft Woodland Cove Decision
14	n/a	n/a	Draft Woodland Cove Decision
14	n/a	n/a	Waiver Decision

This information is:

☒ For Your Information ☐ No Exceptions Taken ☐ Resubmit ___ copies for approval
☐ Unchecked ☐ Furnish as Corrected ☐ Return ___ corrected prints
☐ Preliminary ☐ Rejected ☐ Submit ___ copies for distribution
☐ Revised Plans ☐ Revise & Resubmit ☐ Final Plans
☐ Sent for Your Review & Comment

Remarks: Hard copies of information previously submitted electronically as requested.

Signed: _____

From: Dominic Rinaldi

cc:

Note: If enclosures are not as noted, please contact us immediately.

August 22, 2018

Sandra Slavin, who is not available to present her concerns at this evenings meeting, has concerns with this project that she wishes to make known.

1. The handicapped parking spaces are far from the building entrances, why? Can they be closer?
2. Some buildings only have one handicapped parking space, is this enough?
3. Is the proposed snow storage on the site enough for the number of parking spaces?
4. There is only one trash area on site with no turn-around.
5. Is the play area large enough for all of the children that will be living there?
6. Phases I and II do not have access to the site from Redbrook Road with the only access being from Cranberry Highway with a right in, right out access only.
7. Is the number of stormwater drains enough to handle all of the runoff?
8. Where will the grinder pumps be placed on the site?
9. How will the grinder pumps remain in use in the event of a power outage?
10. Where is the one-way sign on the site proposed to be located? Is it at the exit to Cranberry Highway or in the interior of the site?
11. There are no exterior lights for the playground or for the walkways to the community building.
12. The soil patch for the garden on the site will be overgrown with grass and weeds if people do not utilize this space. Would it be more prudent to plant grass there and have people dig a space in a designated area for a garden should they choose to have one? If not, who will maintain the soil so it is not overgrown?

Town of Wareham
Zoning Board of Appeals

54 Marion Road
Wareham, MA 02571-1428

Phone: (508) 291-3100 x6501
Fax: (508) 291-3116
Email: kbuckland@wareham.ma.us

Ken Buckland, Town Planner
Jasmin Campos, Dept. Assistant

August 20, 2018

Dear Selectmen,

Please review the attached 40B plans revised through August 10, 2018 for the project located at 3102 Cranberry Highway. Please forward comments to our department. Thank you.

Jasmin Campos, Department Assistant

508-291-3100 ext. 6500
jcampos@wareham.ma.us

cc: Fire Department
Police Department
WPC F ~~Water~~ Department
Health Department
Building Department
EMS
Municipal Maintenance
Charles Rowley
Conservation Commission

BSC GROUP

803 SUMMER STREET, BOSTON, MA 02127 - www.bscgroup.com
TEL 617-896-4300 - 800-288-8123

TRANSMITTAL

To: Mr. Kenneth Buckland
Town Planner
Wareham Memorial Town Hall
54 Marion Road
Wareham, Massachusetts 02571

Date: August 16, 2018
Proj. No.: 83669.00
Project: Woodland Cove

We are sending you:

☒ Attached ☐ Under Separate Cover

Via:

Delivery Tracking No.: _____

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☐ Messenger ☐ Direct From Printer ☐ Other: _____

The following item(s):

☐ Change Order ☐ Drawings ☐ Prints ☐ Samples
☒ Copy of Letter ☐ Photocopies ☒ Reports ☐ Specifications
☐ Digital Media ☒ Plans ☐ Other: _____

No. of Copies	Drawing No.	Date or Revision	Description
14	Various	08/10/18	Revised plan set (full size)
8	Various	08/10/18	Revised plan set (11"x17")
8	n/a	08/13/18	Illustrative Site Plan (11"x17")
14	n/a	08/10/18	Response letter to peer review comments
4	n/a	08/10/18	Revised drainage calculations

This information is:

☒ For Your Information ☐ No Exceptions Taken ☐ Resubmit ___ copies for approval
☐ Unchecked ☐ Furnish as Corrected ☐ Return ___ corrected prints
☐ Preliminary ☐ Rejected ☐ Submit ___ copies for distribution
☐ Revised Plans ☐ Revise & Resubmit ☐ Final Plans
☐ Sent for Your Review & Comment

Remarks: Hard copies of information previously submitted electronically as requested.

Signed: _____

From: Dominic Rinaldi

Note: If enclosures are not as noted, please contact us immediately.

BSC GROUP
Transportation ▪ Energy ▪ Land Development

803 Summer Street
Boston, MA 02127

Tel: 617-896-4300
800-288-8123

www.bscgroup.com

August 10, 2018

Town of Wareham Zoning Board of Appeals
Memorial Town Hall
54 Marion Road
Wareham, MA 02571

RE: Response to Peer Review for Woodland Cove, Comprehensive Permit
3102 Cranberry Highway, Wareham, Massachusetts

Dear Chairman Elkallassi and Board of Appeals Members:

On behalf of the Applicant for the above referenced project, BSC Group, Inc. (BSC) offers the Board the following responses to comments received in a letter from Mr. Charles L. Rowley, PE, PLS dated August 7, 2018. For each numbered comment provided, we have restated the comment in full and provided our response below it in bold.

General Comments

1. The density of the project continues to be of concern. Due to the space occupied by buildings, driveways and parking spaces, there is no room remaining to provide for basic amenities.

   APPLICANT RESPONSE: The project density and unit count have previously been reduced from 174 units to 150 units as presented and agreed to with the Board.

   a. There is no visitor parking.

      APPLICANT RESPONSE: As discussed at the Public Hearing on August 8, 2018, designated visitor parking spots have now been identified on the Layout & Materials Plan (Sheets C-2.0 through C-2.2).

   b. The single loading area provided is at the southeast corner of the site and is located in front of a fire access lane. What is the method and type of deliveries that might be expected? The one space is inconvenient for all but the closest building.

      APPLICANT RESPONSE: The delivery area has been shifted to the south so as not to conflict with the fire access. As previously discussed during Public Hearings, while each building will have its own mail room, all package deliveries will be made to the Community Building where residents will pick up. Therefore, the location of delivery area is appropriate for access to the Community Building. In addition, the delivery area has been enlarged to potentially accommodate multiple delivery vehicles arriving simultaneously.

   c. There is no provision for a bus stop for either general pickup or a place for children to gather while waiting for a school bus during inclement or cold weather.

      APPLICANT RESPONSE: Two 12-foot by 6-foot concrete pads with bus shelters have been added to the project and located adjacent to the Red Brook Road driveway entrance.

d. Parents who want to sit with children in a vehicle while waiting for a school bus are forced to park in a portion of the access driveway limiting back and forth travel in the driveway area.

APPLICANT RESPONSE: As stated above, bus stop access with shelters have been added. Additionally, if the delivery parking area is empty, parents can park in this location while waiting for the bus.

e. The single dumpster site is located in the northwest corner of the site in an area that is most remote for most residents.

APPLICANT RESPONSE: Single trash disposal location is common in multi-building residential complexes. No additional disposal areas are proposed. The Applicant's experience managing similar sites has demonstrated the multiple disposal areas results in additional traffic congestion from residents and collections as well as greater opportunity for wind-blown litter.

f. There is no area that is designated or available to plow snow away from parking spaces.

APPLICANT RESPONSE: Snow storage areas have been added to the Layout & Materials Plan (Sheets C-2.0 through C-2.2).

g. There is no vehicle access or basic parking provided for the community building. All access for services to the building would either be over grassed areas, dirt walking paths or over the fire access lane.

APPLICANT RESPONSE: Any deliveries, service, etc. will be provided via the designated delivery space over asphalt walkways. Access for residents is provided via ADA/AAB compliant walkways located throughout the site. In addition, as previously requested by Mr. Rowley, an extra accessible parking space has been located southeast of Building D, adjacent to the asphalt walkway to the Community Building. Residents may use the parking located at the southern end of the parking areas if they wish to park closer to the Community Building.

h. The only play/recreation area for Phase I is for a partial sidewalk that goes nowhere. The Community Building is planned for Phase II.

APPLICANT RESPONSE: Phase I will include over 30,000-square feet of open space for recreation and resident use. As discussed during the Public Hearing, the Community Building is being constructed in Phase II. The Applicant believes based on their experience managing similar facilities that the open space proposed for Phase I is sufficient for the initial 63 units.

Fire Department Plan

1. A turning movement plan dated July 23, 2018 was provided using a template for an aerial ladder truck with a 17'-10" wheelbase.

APPLICANT RESPONSE: No response required.

2. The various areas where fire access are shown between buildings consist of a 6' wide asphalt strip with 6' wide grasscrete strips on each side.

APPLICANT RESPONSE: No response required.

3. It is clear from the patterns of the turning movements that access from the project driveways will be very difficult to achieve. Parking spaces on each side of the access driveways will inhibit all but the tightest turns for apparatus attempting to get between the buildings. No determination has been made as to the ease of backing out of such tight surroundings.

   APPLICANT RESPONSE: The plan referenced has been reviewed and approved by the Fire Department for access, turning movements, and hydrant locations. Therefore, no revisions are proposed or required.

4. Based on the lines of travel shown there may not be room to make the turns if cars are parked in spaces on the opposite sides of the driveways.

   APPLICANT RESPONSE: The plan referenced has been reviewed and approved by the Fire Department for access, turning movements, and hydrant locations. Therefore, no revisions are proposed or required.

5. Fire hydrants are shown behind parking spaces. There should be at least a 10' clear space around hydrants in order to provide access for connections to fire apparatus. (RMV Rules of the Road)

   APPLICANT RESPONSE: The plan referenced has been reviewed and approved by the Fire Department for access, turning movements, and hydrant locations. Therefore, no revisions are proposed or required.

Project Lighting and Illumination

1. There is no detail as to the type of lighting that is to be employed in the project area or at the entrances. Details should be provided.

   APPLICANT RESPONSE: Lighting details remain the same as previously reviewed and are shown on the Photometrics Plan (Sheets C-7.0 through C-7.2).

2. There is no illumination plan to indicate the intensity of lighting that will be around the site. There should be sufficient lighting to make vehicle and pedestrian access safe while being sensitive to the impacts on neighbors and to residents of the project. An illumination plan should be provided.

   APPLICANT RESPONSE: Project photometrics are shown on the Photometrics Plan (Sheets C-7.0 through C-7.2).

Plans

Sheet C-2.0

1. Note 12 indicates all curbing to be hot mix asphalt unless otherwise marked. Asphalt curbing, unless it is Cape Cod berm, is not a recommended material due to its high potential for damage due to snow plowing activities and ordinary abuse except where it is backed up by a concrete or asphalt sidewalk.

   APPLICANT RESPONSE: Curbing adjacent to sidewalks has been revised to be extruded concrete curb. All other curbing shall be Cape Cod berm unless specifically noted on the Plans. The note has been revised accordingly.

2. Note 18 discusses "non-accessible" parking spaces as being 9.5' x 19' and "non-accessible" compact spaces as being 8' x 15'. It is assumed that "non-accessible" means spaces as being non-handicap in nature.

APPLICANT RESPONSE: The assumption is correct.

3. The legend indicates cross hatched areas for potential snow storage. Where are these areas on the plans?

   APPLICANT RESPONSE: These areas are now shown on the Plans.

Sheet C-2.1

1. Two areas are shown for compact cars; 21 spaces opposite building B and 22 spaces opposite building E. The justification for the location of all of these spaces appears to be due to a grading issue and not so that they would be convenient throughout the site. Opposite building B there is a slope and opposite building E a long retaining wall is required.

   APPLICANT RESPONSE: The compact parking spaces shown are allowed in accordance with Zoning.

2. Building B and building E are four-story buildings with 36 units each. Building F is a three-story building with 27 units. But building F with 9 fewer units gets two handicap parking spaces where buildings B and E with 36 units each only get one handicap parking space. Please explain. Ref: 521 CMR 10.3 and 521 CMR 23.2

   APPLICANT RESPONSE: The Project complies with the referenced sections of the AAB regulations. However, the spaces have been redistributed so that the 2-spaces are located adjacent to the 36-unit buildings and 1-space is located adjacent to each of the other buildings. As noted above, an extra accessible space is located southeast of Building D to provide easier access to the Community Building.

3. The delivery parking stall should be relocated away from the fire department access.

   APPLICANT RESPONSE: As stated above, this has been done.

4. The mountable curb should not be used in front of the fire department access and should not be part of proposed delivery areas.

   APPLICANT RESPONSE: The Fire Department specifically requested and approved the mountable curb. As previously stated, however, the delivery area has been relocated away from the fire access, so mountable curb is no longer located along this space.

Sheet C-4.0

1. This overall utility sheet indicates that there are opportunities to relocate the fire hydrants to the island areas shown where they would not be blocked behind parked vehicles. It is recommended that the locations be revised accordingly.

   APPLICANT RESPONSE: The Fire Department has reviewed and approved access, turning movements, and hydrant locations. Therefore, no revisions are proposed or required.

Sheet C-4.1

1. The finish floor elevation of building E is 72.0 according to grading plan 3.1. The invert of the sanitary sewer at the foundation is 69.51. Based on the length of potential pipe run the building it is recommended that the pipe elevation be checked to be sure that there is sufficient in elevation from one end of the building to another. Pipe slope is ¼ inch per

foot for piping 3" diameter and less and 1/8" per foot for pipe over 3" diameter according to the plumbing code. Other buildings appear to have sufficient elevation to reach the sewer manhole in Cranberry Highway without a problem.

APPLICANT RESPONSE: The invert referenced has been lowered, allowing additional leeway for plumbing installation.

Sheet C-4.2

1. The sewer manhole in Cranberry Highway that will receive flow from the development may have to be rebuilt. The note on the plan suggests that the manhole will only have to be cored through to receive the flexible boot. The notation should also indicate that the manhole will require a new flow channel as well.

   APPLICANT RESPONSE: A note to this effect has been added.

2. It is my understanding that the Sewer Department will require a holding tank and grinder pumps to be installed on site. No details are shown as to where this will be done or what the design will be.

   APPLICANT RESPONSE: No holding tanks are required. At the request of the Sewer Department, eOne grinder pump stations will be installed at each building to mitigate potential non-flushable items that enter the sewer system. These units are identified on the Plans and details have been added to the Detail Sheets.

Sheet C-5.0

1. Why is the temporary cul-de-sac not made part of Phase I? If it is not essential to Phase I why would it be to Phase II where Phase II includes the second access to Red Brook Road?

   APPLICANT RESPONSE: The temporary cul-de-sac is part of Phase I and is hatched as such on this Plan and shown on Sheet C-5.1. The temporary cul-de-sac is not located on Lot 1 so as to maximize the parking included in Phase I, while simplifying the dimensions of Lot 1. Easements for the construction and use of the temporary cul-de-sac will be required.

2. If the purchase of Phase I occurs and the purchase of Phase II were not to go forward what happens to the cul-de-sac that is outside the Phase I area?

   APPLICANT RESPONSE: The temporary cul-de-sac would remain in place via an easement as stated above.

Sheet C-5.1

1. The end of the parking area near the rear of the site has what appears to be part of a retaining wall to be constructed. No details as to the type of wall are included.

   APPLICANT RESPONSE: The rear (north) of the site has been regraded to eliminate the need for retaining walls.

2. The cul-de-sac appears to be in the area that requires a substantial amount of fill in order to bring it to grade. Temporary grading is necessary for this to be included within Phase I and should be shown on the plans.

   APPLICANT RESPONSE: Temporary grading for each phase will be provided on the Final Plans submitted before the start of any construction.

Sheet C-5.2

1. The Phase II plan indicates that the driveway from Red Brook Road to the beginning of parking for building F would only be given a binder course of asphalt. What happens if Phase III is not built? When does the final course of asphalt get installed?

   APPLICANT RESPONSE: The driveway referenced will be used for construction and emergency access only and not for the residents during Phase II and Phase III construction. The driveway will be constructed to binder during Phase II prior to any Phase II occupancy. A note has been added to the Plan requiring the driveway to be completed to finish grade and surface no later than 2-years after the completion of Phase II, at which point, it could be used for full site access.

2. The concern for the phasing questions is based on a reading of the purchase and sale agreement that was first provided in the application package. No portion of the project should be left in an unfinished state with the chance that the full project might not be completed as shown on the full site plan.

   APPLICANT RESPONSE: Each Phase will be finished to completion at occupancy.

Sheet C-5.3

1. A notation should be placed on the plan indicating that the access driveway within Phase III is to be fully constructed and including the upgrade to any portion of the driveway that may need repairs from the construction of Phase II.

   APPLICANT RESPONSE: The requested note has been added.

Sheet C-6.0 Details

1. The site plan does not include the location of where the construction entrance is to be implemented. Show each location.

   APPLICANT RESPONSE: While the construction entrance locations will ultimately be determined by the contractor, locations have been shown on the Phasing Plans (Sheets C-5.1 through C-5.3).

2. Where fire department access crosses sidewalks or stamped hot mix pavement, the cross section of materials should be the same as for the Hot Mix Asphalt Pavement Section due to the need to support heavy loads. Mountable curbs should not be used in front of the fire department access sections.

   APPLICANT RESPONSE: Notes and details have been added to the Plans to require the stamped asphalt islands and all walkways used in fire truck access to be Heavy Duty Asphalt sidewalks with the same section as the driveways and parking areas. The mountable curbs were specifically requested and approved by the Fire Department.

3. The use of hot mix asphalt curbing is only acceptable where it is backed up by bituminous sidewalks. It is not acceptable where it is used merely as pavement edging due to its susceptibility to damage and displacement. Instead the use of precast concrete curb, granite curb, extruded fiberglass impregnated cement concrete curb or Cape Cod berms are encouraged.

APPLICANT RESPONSE: Curbing adjacent to sidewalks has been revised to be extruded concrete curb. All other curbing shall be Cape Cod berm unless specifically noted on the Plans. Details have been added accordingly.

Sheet C-6.1 Details

1. It is unclear if the 6' vinyl privacy fence is to be used around the dumpster enclosure or if there are other locations for it. The Reinforced Concrete Pad detail shows an 8" thick slab with 12" of gravel borrow under it. The Privacy Fence detail shows a 6" slab with 6" of granular fill under the slab. What is "granular fill"? Details should be consistent if part of the same construction.

   APPLICANT RESPONSE: For simplification, the separate privacy fence detail has been removed and applicable information is included in the Dumpster Enclosure detail.

Sheet C-6.2 Details

1. Area Drain Detail: Specify the size of the riser pipe and the specification for the beehive type cast grate.

   APPLICANT RESPONSE: This information has been added.

2. Catch Basin and Drainage Manhole Details: Specify a 12" thick by 12" deep ring of cement concrete to surround the casting with the top surface brought level with the binder course of pavement. The note only indicates the thickness for non-paved surfaces. Identify the castings to be used by manufacturer and model number.

   APPLICANT RESPONSE: This information has been added.

3. Stone Dust Walk Detail: The use of stone dust for the walks in the recreation and common area is unacceptable. Walks should be bituminous concrete in compliance with the sidewalk detail shown elsewhere in the plans for ease of maintenance, durability and safety.

   APPLICANT RESPONSE: As discussed at the Project's Public Hearing, the stone dust walkways will remain as shown on the Plans.

Sheet C-6.3 Details

1. Bio-Retention Area Detail: Specify the intermediate stone size shown in the cross section. Separate the soil mix layer from the stone layer with filter fabric.

   APPLICANT RESPONSE: The Detail calls for #8 crushed stone which is a standard classification of material and is a mixture of small particles of river rock. Also called pea gravel this stone ranges in size from 1/8-inch to 3/8-inch and acts as a filter between the planting soils and the ¾-inch crushed stone. Filter fabric separation is not recommended due to the tendency to clog over time with planting soil fines.

2. Sanitary Sewer Manhole Detail: Change note 5 to include a thickness of the concrete collar around the casting frame to include a depth of 12".

   APPLICANT RESPONSE: This information has been added.

Sheet C-6.4 Details

1. Contech Water Quality Unit Detail: Include a note that indicates that castings brought to grade will have the same cement concrete sealing collar as other structures used throughout the project.

   APPLICANT RESPONSE: This information has been added.

2. Trench Detail: Include detail to show that existing pavements should be saw-cut a minimum of 12" in back of the open trench width with the depth of base material and mix as indicated in other plan details. Flowable fill may be required in existing pavement areas.

   APPLICANT RESPONSE: This information has been added.

3. The location of the sign as shown in detail on this sheet and as indicated on Sheet C-2.2 of the plan could be misleading. It would be better to have a one-sided front facing sign at each of the entrances. There is no indication as to how the sign will be lit.

   APPLICANT RESPONSE: The sign at the Cranberry Highway entrance will remain as previously shown. A second single-sided, front facing sign will be installed adjacent to the Red Brook Road entrance. The sign detail will remain the same. The signs will be uplit from the adjacent landscape beds.

Sheet C-6.5 Details

1. Several of the trees shown on the landscape plan are to be 3.5" diameter suggesting that they will be relatively tall. There are no details shown as to how these trees will be supported while they take root or how they will be watered.

   APPLICANT RESPONSE: This information has been added.

2. It is recommended that water sacks be used around all tree plantings to keep the root system moist.

   APPLICANT RESPONSE: This information has been added.

Sheet L-1.0, L-1.1, L-1.2

1. The landscape plan indicates that there will only be 4 ornamental type trees (downy serviceberry) in front of each building. No other landscape features around the building are proposed. These trees are small and will provide no shade to the surrounding areas.

   APPLICANT RESPONSE: The downy serviceberry has been replaced with a larger species to provide additional shade.

2. Other trees to be planted around the walking path of the recreation area include several "whitespire birch" which, according to limited research, have a relative short life span and tend to like moist acidic soils.

   APPLICANT RESPONSE: Birch trees are pioneer species and are commonly found growing in sandy soils.

3. Other proposed trees include white oak, black oak, eastern red cedar and pitch pine. No eastern white pines are included which are native to the area and predominate much of the existing vegetation found on the site.

APPLICANT RESPONSE: Plant species have been proposed to increase diversity of the area and are partially based on "Native Plants Suitable for the Cultivated Cape Cod Landscape" plant list found at www.grownativemass.org. We will consider Eastern White Pine were appropriate.

4. In general, the landscape plan is relatively sparse given the size and scale of the buildings shown on the plans. More attention should be given to flower beds and other landscape amenities that will enhance the project. Much of the intense landscape features are centered around the community building.

   APPLICANT RESPONSE: The Landscape Plans have been revised to include additional plantings.

5. The plans do not indicate how all landscape features will be maintained after the landscape contractor is finished with the project. How will grass plots and stone dust walking paths be maintained and who will be responsible if there are potentially three separate phases not under the control of a single entity? Please explain.

   APPLICANT RESPONSE: The property will be managed by one property management company that will contract with a landscape contractor to maintain the landscaping upon completion of the construction.

Site Grading and Stormwater Design

1. Site grading and stormwater facilities are shown on plans 3.0, 3.1 and 3.2.

   APPLICANT RESPONSE: No response required.

2. Substantial retaining walls are required in two areas of the site.
   a. At the rear of the property behind building E and
   b. At the most easterly property line behind building F and the parking area that extends to the northeasterly corner of the property.

   APPLICANT RESPONSE: As previously stated, the rear (north) of the site has been regraded to eliminate the need for retaining walls.

3. Wall height varies with the topography but at the highest points along their lengths, the exposed height reaches 7 feet. This suggests that the retaining walls are structures and will need approval as to design from the building inspector. In addition, each wall should have a safety fence to prevent falls.

   APPLICANT RESPONSE: As previously stated, the rear (north) of the site has been regraded to eliminate the need for retaining walls.

4. No details have been presented to indicate the type of walls to be constructed. Walls most likely will be cantilevered walls or segmented walls requiring geogrid retaining elements. Relieve from back pressure will also be required. A copy of the approved designs by the building inspector should be filed with the Planning Office for reference.

   APPLICANT RESPONSE: As previously stated, the rear (north) of the site has been regraded to eliminate the need for retaining walls.

5. The finish floor grade (FFE) of Building E is 72.00 according to Plan C-3.1. Finish grade around the building is also at 72.0 leaving no freeboard between the top of first floor patios and the surrounding grade.

APPLICANT RESPONSE: This area has been regraded to provide additional "freeboard" around the building.

6. The proposed slope of the finish grades from buildings B and F is toward building E. Only one area drain has been provided to the rear of building E which may not be anywhere enough to capture surface runoff during heavy storm events or during winter months when wet and slushy conditions could plug the drain. If storm water builds to elevation 72 in that area it could flood the first floors of building E.

   APPLICANT RESPONSE: The areas in question do not all drain to the area drain. Much of this area drains to the parking lot adjacent to Building E. A separate HydroCAD analysis of a "worst-case" scenario for this area is attached demonstrating that the area drain is sufficient.

Drainage Calculations

1. The concern for surface drainage around building E continues with respect to how the runoff gets to the subsurface storage and infiltration system behind the building. Although there is a connecting pipe shown on the plans, there is no hydraulic connection between the two areas in the calculations. The size of the beehive cover and pipe will influence the rate at which the runoff is disposed of.

   APPLICANT RESPONSE: The areas in question do not all drain to the area drain. Much of this area drains to the parking lot adjacent to Building E. A separate HydroCAD analysis of a "worst-case" scenario for this area is attached demonstrating that the area drain is sufficient.

2. The bio-retention area at the northeast corner of the site receives direct surface runoff from the immediate area as well as overflow runoff from the subsurface storage and infiltration area mentioned above. During the 100-year event the discharge pipe is submerged meaning there is no free discharge. The calculations do not take the submerged pipe into consideration.

   APPLICANT RESPONSE: The HydroCAD calculations have been updated to use the program's dynamic pond routing feature which automatically incorporates downstream tailwater effects into the results. As shown in the attached, revised HydroCAD, this does not result in any discernable changes to the results. Therefore, the Project, as designed, still complies with Stormwater Standard 2.

3. Since the bio-retention area contains engineered soils that are 2 feet deep within its area and which are planted, the infiltration rate for the engineered soil will not be the same as the underlying well-drained Carver series sands. When calculating the infiltration within this area the rate should be substantially reduced to reflect the impact of the engineered soils. A rate of 8.0 inches per hour is too rapid unless it is directly into the natural deep sand deposits on the site. Additional infiltration capacity will be needed in the design.

   APPLICANT RESPONSE: While the specified planting soil can achieve the infiltration rate used, we have revised the HydroCAD analysis to eliminate infiltration from the bio-retention area entirely. As shown on the attached, revised calculations, this has no significant bearing on the results.

4. These issues are significant to the overall design of the drainage system and should be reviewed. A full drainage review will continue with the details of each area that include roof drainage and the collection of runoff from paved surfaces. There are other infiltration

systems within the site that will be checked for capacity for the 2-year, 10-year and 100-year storm events.

APPLICANT RESPONSE: No response required.

Please do not hesitate to contact our office should you have any questions on these responses. We look forward to discussing the project further at the upcoming public hearing. Thank you.

Sincerely,
BSC Group, Inc.

Dominic Rinaldi, P.E., LEED AP BD+C
Senior Project Manager / Senior Associate

cc: J. O'Brien, Dakota Partners, Inc.
P. Freeman, Esq., Freeman Law Group LLC
J. Hession, BSC Group

Re: 40B Cranberry Highway

Charles Rowley <crsr63@verizon.net>

Tue 8/7/2018 4:53 PM

To:Kenneth Buckland <kbuckland@wareham.ma.us>; Mary Healy <mhealy@wareham.ma.us>; Jasmin Campos <JCampos@wareham.ma.us>;

I will be checking that out.
Charlie

Charles Rowley
crsr63@verizon.net

-----Original Message-----
From: Kenneth Buckland <kbuckland@wareham.ma.us>
To: Mary Healy <mhealy@wareham.ma.us>; Jasmin Campos <JCampos@wareham.ma.us>
Cc: crsr63 <crsr63@verizon.net>
Sent: Tue, Aug 7, 2018 4:24 pm
Subject: Re: 40B Cranberry Highway

Thanks.
Charlie Rowley will be making a report on the drainage, may be he will be able to offer corrections.

Kenneth Buckland
Director of Planning and Community Development
Town of Wareham
508.291.3100 x 6501

From: Mary Healy
Sent: Tuesday, August 07, 2018 3:25 PM
To: Kenneth Buckland; Jasmin Campos
Subject: 40B Cranberry Highway

Good afternoon
David has concerns with the drainage, both with the entrance and exits. Also looking at the plans provided it seems as though the water will flow onto Cranberry Highway.

Southeast Commercial Real Estate

Dr. Kimberly Shaver-Hood <kshaver-hood@wareham.k12.ma.us>

Thu 8/2/2018 10:46 AM

To:Kenneth Buckland <kbuckland@wareham.ma.us>;

Good morning Ken,

I met with Michael Giancola yesterday about the proposed commercial building which would be located at 72 Minot Avenue.

We discussed several items, traffic flow, impact to our school, and the potential new elementary building.

The school has not experienced any issues or concerns. Should the proposed building be approved and built, we do not anticipate any issues surfacing. If a concern should arise, I believe both parties are willing to search for an agreeable solution.

Sincerely,
Kim

Dr. Kimberly B. Shaver-Hood
Superintendent
Wareham Public Schools

Town of Wareham
Planning Department

54 Marion Road
Wareham, MA 02571-1428

Phone: (508) 291-3100 x6501
Fax: (508) 291-3116
Email: kbuckland@wareham.ma.us

Rec'd @ MTG. 8/8/18

Kenneth Buckland, Director of Planning and Community Development
Jasmin Campos, Department Assistant

Aug 1, 2018

MEMORANDUM RE: Woodland Cove 40B development concept
Proposed Conditions of Approval

Following are inclusions, changes, and conditions considered and requested for the Woodland Cove development project:

1. **Motel vacated and demolished in Phase I**
2. ~~Project to be built within 6 years~~
3. **No seasonal rentals allowed**
4. **Community Building and open space to be built in Phase ~~I~~2 (as defined on plans)**
5. Temporary **Construction fencing to be installed between phases**
6. **All catch-basins to include oil/water separators (as defined on plans)**
7. **Sidewalks and walkways to be ADA accessible** ~powers?
8. **O&M plan for landscape and drainage to be provided** ~~with easement and penalties~~
9. ~~Landscape contractor to have multi-year contract for maintenance~~
10. **All fees to be paid for water, sewer, curb cut, building, and other local agencies(as published in department regulations or by-laws)**
11. ~~Install crosswalk across Red Brook Road at northern most driveway, with a pedestrian actuated signal~~ CONDITIONAL
12. **Install a bus shelter** ~~or shelters~~ **for school buses** ~~as recommended by the School Department ["Ideally, a bus shelter located in the middle of the two roads in and out would be my thought, IF sidewalks were installed for students to walk to and from. If no sidewalks, I would suggest for safety bus shelters at each point in and out." E-mail from School Superintendent]~~ **(as shown on the revised plans)**
13. In each building provide:
    a. ~~Storage for renters~~
    b. **Laundry facilities (as shown on plans)** DHCD GUIDELINES
14. In the complex provide:
    a. **Manager and Manager's Office (In Community Building)**
    b. ~~One building or building floors with preference for seniors who need a quieter environment~~
    c. **A community room (in community Building)**
    d. **An indoor fitness room (in community Building)**
    e. ~~A children's playroom~~
    f. ~~Workforce services office space; e.g. training program space for youth, ages 16-24~~
15. In the Community Building provide:
    a. ~~Reading room~~
    b. ~~Kitchen for demonstrations and catering~~
    c. ~~Computer lab~~
    d. ~~Cyber cafe~~
16. Activate the open space with:
    a. ~~Lawn furniture~~
    b. ~~Exercise sites~~

Town of Wareham
Zoning Board of Appeals

54 Marion Road
Wareham, MA 02571-1428

Phone: (508) 291-3100 x6501
Fax: (508) 291-3116
Email: kbuckland@wareham.ma.us

Ken Buckland, Town Planner
Jasmin Campos, Dept. Assistant

July 31, 2018

Dear Selectmen,

Please review the attached revised 40B plans for the project located at 3102 Cranberry Highway. Please forward comments to our department. Thank you.

Jasmin Campos

Jasmin Campos, Department Assistant

508-291-3100 ext. 6500
jcampos@wareham.ma.us

cc: Fire Department
Police Department
Water Department
Health Department
Building Department
EMS
Municipal Maintenance
Charles Rowley
Conservation Commission

WAREHAM WATER POLLUTION CONTROL FACILITY

6 Tony's Lane
Wareham, MA 02571
Telephone (508) 295-6144
Fax (508) 291-0155
TTY 1-800-439-2370

Guy Campinha, Director

July 10, 2018

Wareham Zoning Board of Appeals
54 Marion Road
Wareham, MA 02571

Re: Woodland Cove, 3102 Cranberry Hwy.

Attention: Nazih Elkallassi, Chairman

Dear Mr. Elkallassi:

Please find conditions we request to be Part of Conditions for project at Woodland Cove.

We believe that these conditions will mitigate any present and/or future impact to the sewer system by the excessive flow above 15,000 gpd (gallons per day) projected for this project.

1) An analysis of the infrastructure downstream from the proposed project to include, but not limited to, the gravity main, manholes, pump station and treatment process, to determine the impact to any and all of the above. A check for $9,000.00 has been provided by the applicant to complete this process.

2) Mitigate non flushable items that do not breakdown (see flyer enclosed). We would like to see grinder pumps for each building before discharge into the sewer system.

3) The motel to come offline before construction begins. That is 1,200 gpd that needs to come offline as agreed.

4) Phase project over 3-4 years for capacity.

5) Five ($5.00) dollars per gallon of flow to mitigate I&I (Infiltration & Inflow) (314 CMR 12:04 d) as agreed to be paid at completion of each construction phase. No permits issued for next phase until fee is paid.

Phase 1 12,650 gpd = $63,250
Phase 2 12,650 gpd = $63,250
Phase 3 9,460 gpd = $47,300

6) Connections fees (not waived) –

$1500 – plan review
$ 200 - per building connection
$ 200 – trench permit

7) Education material handed out to all tenants discussing what can and cannot be flushed into sanitary system.

8) Present sewer usage rate:

One (1) EDU per apartment
One (1) EDU per building
EDU rate is $596.00 per year per EDU

Also enclosed are copies of meeting minutes from BETA Group and BSC.

If you have any questions, please contact our office.

Sincerely,

Guy Campinha, Director

GC/rbf

Enclosures

cc: Board of Sewer Commissioners

Memorandum

July 6, 2018

To:	Guy Campinha, Sr., Director, Wareham Water Pollution Control Facility	Ref. No.:	11177880
From:	GHD – Marc Drainville, P.E.; Russell Kleekamp	Tel:	774-470-1647
cc:			

Subject: **Sewer Capacity Evaluation for the Proposed Woodland Cove Development Project, Cranberry Highway, Wareham, Massachusetts**

1. Introduction and Table of Contents

This memorandum is intended to summarize the findings of a sewer capacity analysis for a proposed development in the Town of Wareham, MA. The goal of this assignment is to determine if there is suitable existing capacity, or if the proposed development will exceed the existing infrastructures capabilities. This memorandum includes:

1. Introduction and Table of Contents
2. Executive Summary
3. History
4. Purpose of Memorandum
5. Capacity Review – Gravity Sewer Mains
6. Capacity Review – Dick's Pond and Depot Street Sewer Pump Stations
7. Findings

2. Executive Summary

Based on review of record drawings and pump station records provided by the Owner, this section of gravity sewer infrastructure that the Woodland Cove development is looking to connect to, does have the capacity to handle the proposed flows. The proposed flow of 34,760 gallons per day (gpd), based on Title 5 calculations of 110 gpd for 316 bedrooms, from Woodland Cove is not expected to exceed the capacity of the gravity mains or pump stations it will flow through. We also compared this flow under an alternate approach that we recently used for sewer flow developments in Wareham, and in both cases remaining capacity is available for the proposed flows. This alternate approach was to use the actual flow based on water use records of 49 gpd per bedroom, peaked with a factor based on TR-16 guidance.

There is an existing capacity issue at the Wareham Water Pollution Control Facility (WPCF). The WPCF is designed to process 2.0 million gallons per day (mgd) and permitted to discharge 1.56 mgd, and on several

occasions flows the WPCF have exceeded 1.56 mgd (based on pump station records). The WPCF does have overflow lagoons, but if consecutive storms occur—similar to March of 2018 (where the lagoons were about 6-inches from overflowing)—there could be an overflow of the lagoons resulting in a significant negative, and potentially costly, environmental event.

Knowing that there is a pre-existing capacity issue at the WPCF (at no fault of the proposed Woodland Cove development), GHD could not recommend adding any flow to the WPCF until this issue is addressed through, at a minimum, an emergency overflow protocol to minimize environmental impact. Having a plan in place to reduce infiltration and inflow (I/I) would be preferred. The reduction of I/I will likely be the most expeditious way to reintroduce capacity at the WPCF. The reduction of I/I can be performed through numerous approaches that include rehabilitation of aged mains, installation of watertight manhole covers, elimination of illegal connections and other methods.

3. History

Dakota Partners, a real estate developer, has approached the Town of Wareham with a proposed 40B development (called Woodland Cove), located on the former Starlight Motel Property at 3102 Cranberry Highway (Route 6). This is near the intersection with Red Brook Road. The proposed 40B development will include a total of 316 bedrooms housed in six buildings. The total projected daily wastewater flow from this development is 34,760 gpd, based on the Title 5 calculations of 110 gpd/bedroom times 316 bedrooms (see Attachment A).

A meeting to discuss the project took place on May 7, 2018 with representatives from Dakota Partners, BSC Group (consulting engineer for Dakota Partners), Town of Wareham, and BETA Group and GHD (consulting engineers for the Town of Wareham). Meeting minutes and relevant email correspondence discussing project specifics is included in Attachment A.

4. Purpose of Memorandum

The purpose of this memorandum summarized in one sentence is to:

Identify whether or not the addition of the Title 5 calculated flow of 34,760 gallons per day will negatively impact, or overwhelm, the existing sewer infrastructure that will receive this wastewater flow.

Specifically, the main goals of this memorandum are too:

1. Determine the remaining capacity of the gravity sewer system that will receive the proposed flow, and if the proposed flow will exceed the gravity sewer mains remaining capacity.
2. Determine the remaining capacity of the Dicks Pond and Depot Street Pump Stations that will receive the proposed flow, and if the proposed flow will exceed each stations remaining capacity.
3. Provide findings and recommendations for the future development based on the results of the above.

A copy of the contractual scope of services has been included in Attachment B.

5. Capacity Review – Gravity Sewer Mains

Capacity Review: 18-inch gravity sewer located on Cranberry Highway – Connection Point to Dick's Pond Pump Station.

Attachment C contains copies of record drawings of the gravity sewers into which the Woodland Cove project proposes to connect. Specifically, our capacity review will start with the existing 18-inch gravity sewer located at manhole station 49+86.2E as shown on Sheet 7 of Attachment C. To determine capacity of gravity pipe flowing full, Manning's Equation is used to determine a fluid velocity based on the slope and pipe material. If the diameter is known, the full pipe capacity can be determined. Manning's Equation is defined as follows:

$$Q = \frac{k}{n} \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

Where	Q	=	Discharge (m^3/sec., ft^3/sec.)
	k	=	Constant (1.00$m^{1/3}/m^{1/3}$ SI, 1.49$ft^{1/3}/ft^{1/3}$ U.S. customary)
	n	=	Manning's coefficient (unitless)
	A	=	Flow area (m^2, ft^2)
	R	=	Hydraulic radius (m, ft)
	S	=	Friction slope (m/m, ft/ft)

The following table identifies the pipe, slope, and record drawing sheet, along with overall capacity for the gravity mains leading from the connection point to the Dick's Pond Pump Station. An additional field-check of the last gravity manhole was performed to determine if any evidence of manhole surcharging was visible. This field observation was performed on 6/15/18 (by Russell Kleekamp from GHD and Guy Campinha from Town of Wareham) at both influent manholes of Dick's Pond and Depot Street Pump Stations and no surcharging evidence was observed. A Manning's coefficient of 0.013 was used for this evaluation representative of moderately aged PVC pipe.

Table 5.1 presents the results of the gravity main capacity review for the impacted mains from the connection point on Cranberry Highway to Dick's Pond Pumping Station.

Table 5.1 Existing Gravity Sewer Pipe Capacities from Connection Point on Cranberry Highway to Dick's Pond Pump Station

Pipe	Contract	Drawing Sheet	Slope (ft/ft)	Capacity (GPD) at 80% Full
18-Inch PVC Interceptor	Contract No. 88-1	7	0.0014	2,036,000
18-Inch PVC Interceptor	Contract No. 88-1	8	0.0018	2,308,000
18-Inch PVC Interceptor	Contract No. 88-1	8	0.0066	4,420,000
18-Inch PVC Interceptor	Contract No. 88-1	8	0.0011	1,805,000
18-Inch PVC Interceptor	Contract No. 88-1	8	0.0011	1,805,000
18-Inch PVC Interceptor	Contract No. 88-1	9	0.0014	2,036,000
18-Inch PVC Interceptor	Contract No. 88-1	9	0.0060	4,214,000
18-Inch PVC Interceptor	Contract No. 88-1	9	0.0086	5,046,000
18-Inch PVC Interceptor	Contract No. 88-1	9	0.0290	9,266,000
18-Inch PVC Interceptor	Contract No. 88-1	10	0.0015	2,107,000
18-Inch PVC Interceptor	Contract No. 88-1	10	0.0008	1,539,000
18-Inch PVC Interceptor	Contract No. 88-1	10	0.0016	2,176,000
18-Inch PVC Interceptor	Contract No. 88-1	10	0.0014	2,036,000
18-Inch PVC Interceptor	Contract No. 88-1	10	0.0012	1,885,000
18-Inch PVC Interceptor	**Contract No. 88-1**	**11**	**0.0008**	**1,539,000**
18-Inch PVC Interceptor	Contract No. 88-1	11	0.0014	2,036,000
18-Inch PVC Interceptor	Contract No. 88-1	11	0.0013	1,962,000
18-Inch PVC Interceptor	Contract No. 88-1	11	0.0013	1,962,000

The pipe with the shallowest slope, in this case a slope of 0.0008 ft/ft, will yield the lowest capacity in a series of similar-sized gravity sewer mains. DEP design guidelines indicate that a pipe capacity of 80% shall be the maximum design capacity. Therefore, this 18-inch gravity network has a maximum capacity of 1.54 mgd, as multiple pipes have a slope of 0.0008 ft/ft.

The Town of Wareham provided pump station flow rate and run time via their Mission communication system (see Attachment D). This information provided was for the previous 4 months. Typically, it is desirable to review at least 12 months (or longer) of daily sewer flows to determine an average daily flow rate. Because the previous 4 month period included record storm events and multiple nor'easters, the average flows based on the previous 4 months are likely conservative.

The information reviewed for Dicks Pond Pump Station was from February 15, 2018 through June 13, 2018. The average daily flow for this time period was 213,000 gpd.

Using guidance from Chapter 2 of TR-16, Design of Wastewater Treatment Works, a peak flow factor for a daily discharge of 213,000 gpd can be estimated at a factor of 5.0 (see Figure 2-1 of Attachment F). This means that if we multiply the average daily flow of 213,000 gpd by a factor of 5.0, this would give us a peak flow of 1.06 mgd.

When reviewed against the maximum capacity of 1.54 mgd for this stretch of gravity mains, the remaining capacity is approximately 480,000 gpd. To determine the impacts of the proposed Title 5 flow of 34,760 gpd, we also have to consider that flow under peak conditions and compare that to the reaming capacity of 480,000 gpd.

To be consistent with previous flow development reports that GHD has completed for the Town of Wareham and neighboring communities, we have historically used actual average daily water use per residence (based on water department records) at a quantity of 132 gallons per day, with an average of 2.72 bedrooms per residence equating to 49 gpd per bedroom under average day conditions. The use of actual water use records provides a higher level of accuracy as the amounts are based on real use, and not general number, and is a preferred approach for wastewater calculations when available. By peaking the water use value of 49 gpd by a factor of 5.0, we develop a peak flow per bedroom of 245 gpd; multiplied by the 316 proposed bedrooms totals a sum of approximately 77,420 gpd under peak conditions.

With a remaining pipeline capacity of 480,000 gpd and a proposed peak flow if 77,420 gpd, we do not anticipate any capacity issues with this portion of gravity sewer main.

Once gravity flow enters Dick's Pond Pump Station, it is pumped through a 10-inch force main that discharges into a gravity system further down the Cranberry Highway flowing into the Depot Street Pump Station. The gravity mains leading to Depot Street will be the next and final area of gravity sewer mains that the flow from the Woodland Cove development will see prior to it being pumped directly to the Wareham WPCF.

Table 5.2 presents the results of the gravity main capacity review for the impacted mains leading to the Depot Street Pump Station that receive flow from Dick's Pond Pump Station.

Table 5.2 Existing Gravity Sewer Pipe Capacities Leading to Depot Street Pump Station

Pipe	Contract	Drawing Sheet	Slope (ft/ft)	Capacity (GPD) at 80% Full
18-Inch PVC Interceptor	Contract No. 88-1	13	0.0019	2,372,000
18-Inch PVC Interceptor	Contract No. 88-1	13	0.0230	8,252,000
21-Inch PVC Interceptor	**Contract No. 88-1**	**13**	**0.0007**	**2,171,000**
21-Inch PVC Interceptor	Contract No. 88-1	13	0.0010	2,595,000
21-Inch PVC Interceptor	Contract No. 88-1	14	0.0013	2,959,000
21-Inch PVC Interceptor	Contract No. 88-1	14	0.0009	2,462,000
21-Inch PVC Interceptor	Contract No. 88-1	14	0.0010	2,595,000
21-Inch PVC Interceptor	Contract No. 88-1	14	0.0011	2,722,000
21-Inch PVC Interceptor	Contract No. 88-1	15	0.0011	2,722,000
21-Inch PVC Interceptor	Contract No. 88-1	15	0.0113	8,725,000

For this network of gravity pipes, based on the rationale stated prior, the maximum capacity is approximately 2.2 mgd.

The Town of Wareham provided pump station flow rate and run time via their Mission communication system (see Attachment D). This information provided was for the previous 4 months. Typically, it is desirable to

review at least 12 months (or longer) of daily sewer flows to determine an average daily flow rate. Because the previous 4 month period included record storm events and multiple nor'easters, the average flows based on the previous 4 months are likely conservative.

The information reviewed for the Depot Street Pump Station was from February 15, 2018 through June 13, 2018. The average daily flow for this time period was 468,000 gpd.

Using the same rationale as stated above, when we multiply the average daily flow of 468,000 gpd by a peaking factor of 4.3, we end up with a peak flow of approximately 2.0 mgd. The peaking factor is reduced based on the chart included in Attachment F, Figure 2-1.

When reviewed against the maximum capacity of 2.17 mgd for this stretch of gravity mains, the remaining capacity is approximately 171,000 gpd. To determine the impacts of the proposed Title 5 flow of 34,760 gpd, we also have to consider that flow under peak conditions and compare that to the reaming capacity of 171,000 gpd.

To be consistent with previous flow development reports that GHD has completed for the Town of Wareham and neighboring communities, we have historically used actual average daily water use per residence (based on water department records) at a quantity of 132 gallons per day, with an average of 2.72 bedrooms per residence equating to 49 gpd per bedroom under average day conditions. The use of actual water use records provides higher level of accuracy as the amounts are based on real use, and not general number, and is a preferred approach for wastewater calculations when available. By peaking the water use value of 49 gpd by a factor of 5.0, we develop a peak flow per bedroom of 245 gallons per day; multiplied by the 316 proposed bedrooms totals a sum of approximately 77,420 gpd under peak conditions.

With a remaining pipeline capacity of 171,000 gpd and a proposed peak flow of 77,420 gpd, we do not anticipate any capacity issues with this portion of gravity sewer main.

6. Capacity Review – Dick's Pond and Depot Street Pump Stations

The Mission communication system indicates that Dick's Pond Pump Station has two 5-inch Fairbanks Morse Pumps, model number B5414. The pumps are rated at 652 gpm and 531 gpm, and are set up in parallel. Town records (see Attachment E) indicate that the variable frequency drives installed in 2004 are in good operating order. There are no reportable occurrences where both pumps at Dick's Pond station had to operate in tandem to handle excessive flows, which are consistent with pump flow rate records indicating approximately 300,000 gpd has been the maximum pumped flow between February 15, 2018 and June 13, 2018. At a rate of 531 gallons per minute (gpm), or 764,640 gpd, there is no indication that an additional Title 5 calculated flow of 34,700 gpd or the peak flow of 77,420 gpd from the Woodland Cove development would negatively impact the pumps or operation at Dick's Pond Pump Station.

The Mission communication system indicates that the Depot Street Pump Station has two 6-inch Fairbanks Morse Pumps, model number B5414. The pumps are rated at 1,400 gpm each, and are set up in parallel. There was one minor reportable occurrence where both pumps at the Depot Street station had to operate in tandem to handle flows for 1.7 minutes on June 7, 2018, but there are no other reportable incidents since February 15, 2018. At a pump rate of 1,400 gpm, or just over 2 mgd, there is no indication that an additional

34,700 gpd or the peak flow of 77,420 gpd from the Woodland Cove development would negatively impact the pumps or operation at Depot Street Pump Station.

7. Findings

Based on the capacity analysis performed on the impacted gravity mains and review of two pump stations run times and pump rates, we have reason to believe the proposed wastewater flow from Woodland Cove development will not exceed the capacity of this specific infrastructure. Under existing conditions, the gravity mains on the Cranberry Highway have remaining capacity, based on using the 80% full design criteria. Without the installation of flow meters to acquire detailed actual peak factors, we used factors from TR-16. Because this area is a combination of residential and commercial flow, the factors used could be considered conservative, as commercial flow typically has a lower peaking factor.

Both pump stations also appear to have sufficient remaining capacity. Based on the information provided, the stations do not appear to require both pumps to handle existing flows, which is indicative of either pump capable of handling existing flows. This also supports that the peaking factors used were conservative. For example, we estimated a peak flow of 1.06 mgd at Dick's Pond station using TR-16 guidance; however pump run times indicated there was no occurrence of both pumps running between February 15, 2018 and June 13, 2018. The larger of the two pumps only has a rated capacity of 0.94 mgd, so if the station ever did see flows over this value, there would be recordings of both pumps running, which there is not.

While there are no indicators that the flow from the proposed Woodland Cove project will be of concern, review of the pump station information did reveal a concerning trend at the Wareham WPCF regarding remaining capacity. The WPCF has a permitted discharge of 1.56 mgd and design capacity of 2.0 mgd. During the month of March 2018, on several occurrences, pump station records indicated that the three major stations pumping to the WPCF (Narrows, Hynes, and Depot) exceeded combined flow rates of 2.0 mgd. The WPCF does have overflow lagoons, but when repeated storm events coupled with limited reserve capacity occurs, the potential impacts could be significant, resulting in overflows at the WPCF to the Agawam River.

Projections of sea level rise and climate change only indicate that conditions will steadily get worse, and we can anticipate storms similar in strength to those of March 2018, if not more severe. Because we have already exceeded capacity at the WPCF, adding flow of any amount could potentially have a negative effect at the WPCF.

GHD strongly recommends development of a plan to increase reserve capacity at the WPCF. This can be done through a variety of measures that include removal of I/I, modifying the process of the treatment plant (adding clarifiers), modifying operations through pump station communication, structurally increasing the capacity of the lagoons, or a combination of such. The reduction of I/I is likely the most expeditious manner to restore capacity at the WPCF. This can be performed through a variety of approaches that includes repair / rehabilitation of aged sewer mains through either lining or replacement, water proofing manholes and covers, elimination of illegal connections and other methods. Given the current capacity issue at the WPCF, we would recommend the Town of Wareham implement an I/I reduction policy or plan for future connections that will offset any proposed flows.

An overflow or response plan/protocol should also be developed immediately as we have documented exceedances at the WPCF based on pump station records.

This current capacity issue at the WPCF is not the result of the Woodland Cove or any planned sewer expansion. GHD would not recommend expanding any wastewater flow to the Wareham WPCF until a plan to address the overflow capacity is developed.

Attachment A: Meeting Minutes May 7, 2018

BSC GROUP

803 SUMMER STREET, BOSTON, MA 02127 - www.bscgroup.com
TEL 617-896-4300 - 800-288-8123

MEETING MINUTES

To:	James V. O'Brien, Dakota Partners, Inc.	**Date:**	May 7, 2018
From:	Dominic Rinaldi	**Proj. No.**	83669.00
Re:	Sewer Study Scope, Woodland Cove, Wareham, MA		
Date of Meeting:	May 4, 2018	**Time:**	8:00 AM
Place of Meeting:	Warehame Water Pollution Control Facility, 6 Tonys Lane, Wareham, MA		
Purpose:	To determine extent of sewer study to be performed during Comprehensive Permit process		
List of Attendees:	Guy Campinha, Wareham Russ Kleekamp, GHD Joseph Federico, BETA Group Christopher Cronin, BETA Group James O'Brien, Dakota Dominic Rinaldi, BSC Group		

Item	Discussion	Action
1	J. O'Brien (JO) provides overview of typical requests Dakota has seen in other communities where they've performed work – modest sewer review fee for town to add flows to existing model along with standard peer review of sewer design. Dakota does not deem it fair to pay $35k for Town to develop a model of their system from site to WWTP.	Info.
2	G. Campinha (GC) describes standard practice in Wareham – Town does not have existing model to plug info into and has required numerous larger projects in town to do the same type of modeling.	Info.
3	There was extensive discussion on the 40B process, what the courts have determined can be required of 40B applicants, and how costs for sewer system issues/upgrades required to accommodate 40B projects are spread through rate payers (including the new development) and amortized over time. GC explains that the Town does not have the ability to amortize improvement costs and, therefore, requires developers to fully fund these improvements at the time of development. GC does not make a distinction between 40B developments and "standard" permitting projects – only concern is protecting the sewer system.	Info.
4	The 18" main on Cranberry Highway that this development would tie into is a critical line in Town as it not only collects the commercial properties along Cranberry Highway, but a large portion of Bourne as well.	Info.
5	The WWTP sees dry weather flows of approximately 1 million gpd and wet weather flows of 5-6 million gpd, demonstrating extensive inflow & infiltration (I/I) issues of collection system. BETA Group (BETA) is currently performing a system-wide I/I study. The Town is planning $10 million investment this year to remove I/I.	Info.
6	In 2011 a WWTP capacity study was performed. Total project sewer flows are	Info.

Item	Discussion	Action
	approximately 34,760 gpd (316 bedrooms x 110 gpd/bedroom).	
7	A discussion of project's phasing ensued. GC, BETA, and GHD did not realize project would be in 3 phases over at least 3 years. This means only approximately 1/3 of total project flows will be seen each year.	Info.
8	Based on phasing, it may be possible to have a sewer impact fee paid by Dakota prior to building permit issuance that would be used to removed I/I from this sewer main to create the capacity required for each phase. Typical impact fees are around $5/gallon.	Info.
9	JO indicated that Dakota would be amenable to a sewer impact fee (see Item 8) being a condition of the Comprehensive Permit to remove I/I and fund the capacity study. JO also indicated that Dakota would be willing to pay for site review not to exceed $10,000.	Info.
10	GC agreed that a phases approach with sewer impact fees due prior to each phase is much more amenable to the Town along with a typical peer review by their consultant.	Info.
11	It was agreed that GC, BETA, and GHD would have further internal discussions to determine impact fees, upfront peer review fees, and other potential conditions they may require as part of the Comprehensive Permit and then make a recommendation to the ZBA. Next ZBA hearing is May 9, so it was agreed that a formal recommendation would likely not come until the following hearing (assumed to be May 23).	Sewer Dept. to provide conditional recommendations to ZBA (estimated prior to May 23 hearing)

cc: P. Freeman, Esq.
K. Buckland, Wareham

From: Chris Cronin
To: Rinaldi, Dominic R.; Russ Kleekamp; Guy Campinha, Sr. (InTouch); Joe Federico
Cc: Jim O"Brien; Kenneth Buckland; Peter Freeman
Subject: RE: Woodland Cove-Sewer Meeting Minutes
Date: Thursday, May 17, 2018 11:23:12 AM

Domenic
Please also provide confirmation on the total estimated sanitary flow from the Woodland Cove Development. Previous information included an estimate of 30,000 gallons per day. The estimate included in the meeting minutes is 316 bedrooms at 110 gpd/bedroom for a total of 34,760 gallons per day.

Thank you

Christopher R. Cronin, PE
Vice President

BETA Group, Inc. | 401.333.2382 | C: 401.525.8008
Twitter | LinkedIn | Facebook

From: Chris Cronin
Sent: Thursday, May 17, 2018 10:42 AM
To: 'Rinaldi, Dominic R.'; russell.kleekamp@ghd.com; gcampinha@wareham.ma.us; Joe Federico
Cc: Jim O'Brien; Kenneth Buckland; Peter Freeman
Subject: RE: Woodland Cove-Sewer Meeting Minutes

Good Morning Dominic

I would like to clarify a couple of items documented in your Meeting Summary for the Woodland Cove Project in Wareham.

1) Regarding Project Phasing. Your notes indicate that the project will be constructed in three phases over at least three years. My notes indicate the following:

   - Property currently has a "Purchase and Sales" Agreement for the entire site and its effective duration is 7 years
   - The plan will be to buy the property in phases
   - Plan to build 63 units/year
   - Equates to a flow of approximately 7,300 gallons for consideration in any given year

   Please confirm that our understanding is accurate.

2) Regarding Plan submission for review. Please confirm that the entire project will be submitted for review and the submission will document the planned project phasing.

Thank you

Christopher R. Cronin, PE
Vice President

BETA Group, Inc. | 401.333.2382 | C: 401.525.8008
Twitter | LinkedIn | Facebook

Join our team!

From: Rinaldi, Dominic R. [mailto:drinaldi@bscgroup.com]
Sent: Tuesday, May 08, 2018 1:34 PM
To: russell.kleekamp@ghd.com; Chris Cronin; gcampinha@wareham.ma.us; Joe Federico
Cc: Jim O'Brien; Kenneth Buckland; Peter Freeman
Subject: Woodland Cove-Sewer Meeting Minutes

Attached are meeting minutes from our discussion last Friday on sewer at Woodland Cove in Wareham, MA. Please let me know if you have any questions, additions, or revisions. Thanks.

Dom

Dominic Rinaldi, P.E., LEED AP BD+C | Senior Project Manager/Senior Associate

BSC Group
803 Summer Street | Boston | MA 02127
direct | 617-896-4386
main | 617-896-4300
email | drinaldi@bscgroup.com

Attachment B: Scope of Work

This is **EXHIBIT A**, consisting of two pages, referred to in and part of the **Agreement between OWNER and ENGINEER for Professional Services** dated May 2018.

ENGINEER's Services

ENGINEER shall provide Basic and Additional Services as set forth below to review the proposed site development at the former Starlight Motel property. The intent of the review is to estimate capacities for the impacted gravity sewers and pump stations from the proposed development. The proposed sewer flow from the new development is an initial flow of 12,650 gpd based on Title 5 calculations, and ultimately 34,760 gpd at full build-out.

PART 1 – BASIC SERVICES

A. **Gravity Sewer Evaluation.** Review the existing record plan and profile for the gravity sewer interceptor that will be impacted by the development. Estimate pipe capacity values based on Manning's Equation. Identify lowest capacity gravity main based on estimates.

B. **Pump Station Evaluation.** Review existing pump size, capacity, flow rates and run times based on OWNER-provide information. Estimate maximum capacity of the two (2) sewer pump stations impacted by this development, being Dick's Pond and Depot Street Stations.

C. **Draft Memorandum.** Develop a draft memorandum identifying estimated capacity issues of the reviewed sewer infrastructure.

D. **Final Memorandum and Findings.** Develop a Final Memorandum based on comments from the OWNER and provide general recommendations based on the review of the proposed development. Final deliverables will include electronic and hard copies of the Final Memorandum.

PART 2 – ITEMS NOT INCLUDED AS PART OF THIS AGREEMENT

The following items and design components are not included as part of this Agreement and would require an amendment to this Agreement:

- Costs of any proposed improvements based on the result of the assignment.
- Any sewer modeling or model development.
- Collection of field data due to missing or unclear Record Drawings.
- Review of any sewer infrastructure that does not connect to the Dick's Pond and East Wareham Sewer Pump Stations.
- Installation of flow meters to verify I/I assumptions. This item may be required at a future date to further verify and/or calibrate the model. It will be considered if running of the steady state model indicates numerous areas of surcharging (capacity issues) and it is desired to further investigate actual limits of these areas.

PART 3 – ITEMS REQUIRED FROM THE OWNER / TOWN OF WAREHAM

The following items from the OWNER will be required to complete this task:

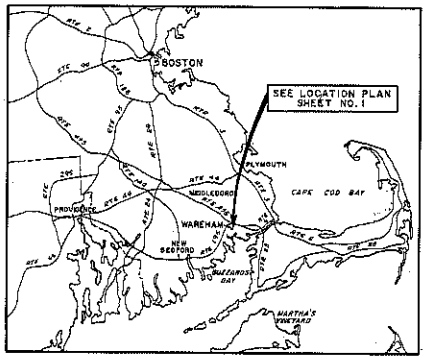
- Access to the plans and record drawings at the Wareham WPCF.
- Available GIS information.

- Pump run time and flow rates of the East Wareham and Dick's Pond sewer pump stations for the complete months of March 2018 and May 2018.
- Copy of the most recent I/I report or study.
- Proposed site plans and flows for the parcel of development.

Attachment C: Sewer Infrastructure Record Plans

TOWN OF WAREHAM, MASSACHUSETTS
BOARD OF SELECTMEN

CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS
CONTRACT NO. 88-1



VICINITY MAP

SCALE IN MILES

INDEX TO DRAWINGS

RECORD DRAWING

E.P.A. PROJECT NO. C250-679

M&E METCALF & EDDY

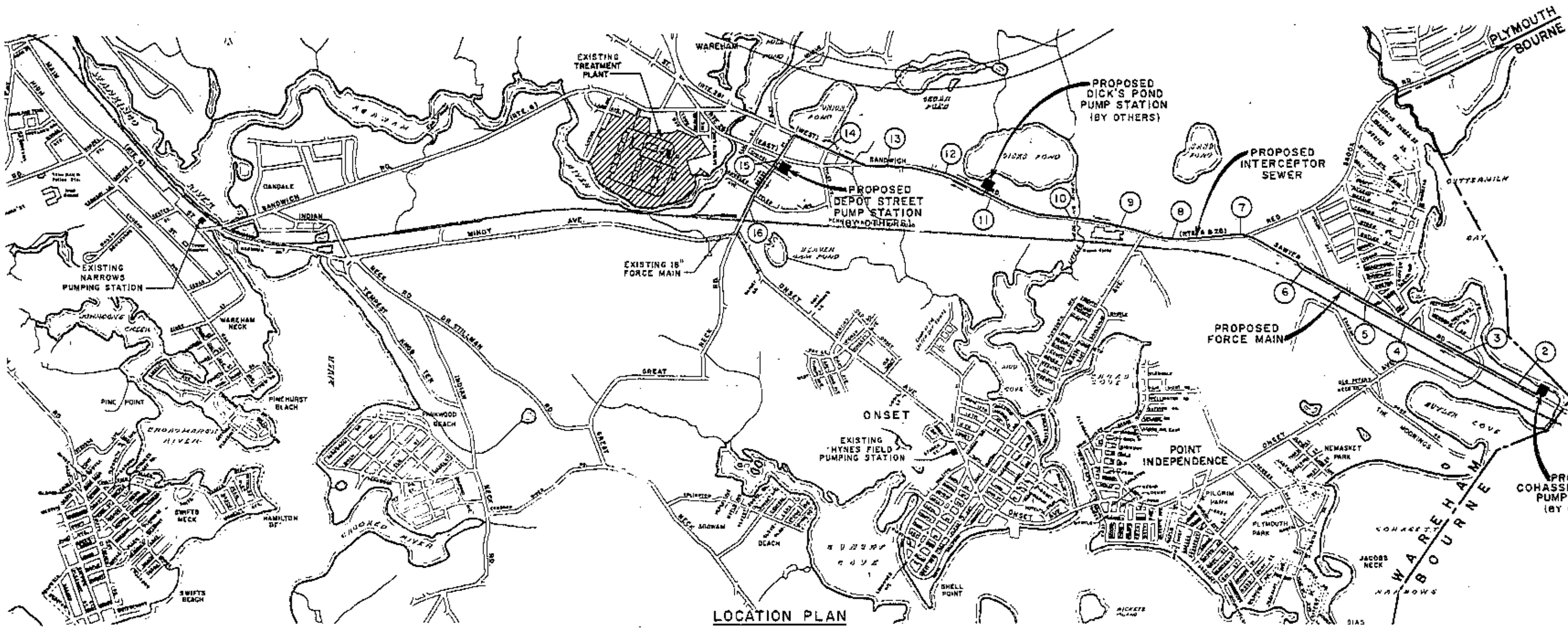
THOMAS A. SPERZIN NO. 27672 COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER

Thomas A. Sperzin
REG. PROF. ENGR. MA. NO. 27672

9/1/88
DATE

#39

H-89675-1



LOCATION PLAN

0 500 1000 2000 3000
SCALE IN FEET
SCALE: 1" = 1000'

LEGEND

PROPOSED

- INTERCEPTOR/SEWER AND MANHOLE
- SEWER WITH "Y" OR "T" CONNECTIONS
- SEWER WITH CHIMNEY
- FORCE MAIN

EXISTING

- 10"D — DRAIN AND MANHOLE
- 2"G — GAS MAIN
- 6"W — WATER MAIN
- PROPERTY LINE
- EASEMENT LINE
- 104 — CONTOUR
- X 210.2 — SPOT ELEVATION
- CB — CATCHBASIN
- SWAMP
- TREE
- HEDGE
- FENCE
- STONE WALL
- #27 17.50 — BUILDING NO. AND SILL ELEVATION (PLAN)
- #30 — BUILDING NO. & SILL ELEVATION (PROFILE)
- B-2 — BORING AND NUMBER

RECORD DRAWING NOTES

1. TIES TO MANHOLES, STATIONING OF MANHOLES AND MEASUREMENTS ALONG THE SEWER ARE REFERENCED TO THE CENTER OF THE FRAME AND COVER.
2. TIES TO CATCH BASINS OR DRAIN MANHOLES ARE REFERANCED TO THE CENTER OF THE GRATE OR THE CENTER OF THE FRAME AND COVER.
3. TIES TO UTILITY POLES ARE REFERENCED TO THE NEAR SIDE OF THE POLE.
4. TIES TO BUILDINGS ARE REFERENCED TO THE FONDATION OF THE BUILDING.
5. PIPE MATERIAL IS POLYVINYLCHLORIDE MANUFACTURED BY
   SPECTER - 6" - 8" - 12"
   J. MANSVILLE - 18" - 21".

BUILDING CONNECTION DATA

STA 4+20 — STATION ON MAIN SEWER OF Y OR T BRANCH CHIMNEY.

D- 6' — DEPTH OF BUILDING SEWER AT TERMINATION MEASURED FROM GROUND SURFACE TO TOP OF PIPE

(260+45) — STATE HIGHWAY STATIONING - APPROXIMATE (TAKEN FROM THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF PUBLIC WORKS "PLAN AND PROFILE OF STATE HIGHWAY IN THE TOWN OF WAREHAM, PLYMOUTH COUNTY", FEDERAL AID PROJECT NO. SN-FAP-125-B(1), FILE NO. 3574)

GENERAL NOTES

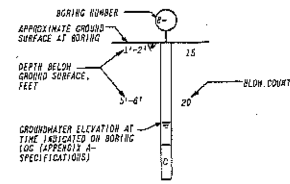
1. ALL ELEVATIONS BASED ON U.S.G.S. MEAN SEA LEVEL.
2. EXACT LOCATION OF EXISTING 18" FORCE MAIN AND 12" STUB TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTING PROPOSED 12" F.M. IN DEPOT STREET.
3. MISCELLANEOUS STANDARD DETAILS AND ADDITIONAL GENERAL NOTES ARE LOCATED IN APPENDIX B OF THE SPECIFICATIONS.
4. BORING LOCATIONS ARE SHOWN ON THE PLANS. BORING LOGS AND INFORMATION ARE BOUND IN THE SPECIFICATIONS, APPENDIX A.
5. THE LOCATIONS OF PROPOSED FACILITIES ARE APPROXIMATE ONLY. EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BASED UPON LAYING LENGTHS OF PIPE AND FIELD CONDITIONS.
6. PROFILES WILL BE REVISED IF NECESSARY ON THE BASIS OF INFORMATION OBTAINED FROM TEST PITS.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL WORK AS INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER IN CONFORMANCE WITH ALL APPLICABLE CODES IN A PROPER AND WORKMANLIKE MANNER.
8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AT THE SITE.
9. FILTER FABRIC, AS SPECIFIED IN SECTION 02273 OF THE SPECIFICATIONS, SHALL BE INSTALLED ALONG THE TRENCH BOTTOM BETWEEN THE FOLLOWING STATIONS AND/OR AS DIRECTED BY THE ENGINEER:

STA. FROM	STA. TO	STA. FROM	STA. TO
0-15S	16+10S	1+30E	25+45E
1+15N	24+00N	1+90	6+00
0+70W	7+50W	0+10B	1+95B

10. AS REQUIRED BY SECTION 01005, TEST PITS ARE TO BE EXCAVATED AT ALL LOCATIONS WHERE INDICATED PRIOR TO CONSTRUCTION OF THE PIPELINE. THE CONTRACTOR IS REQUIRED TO SUBMIT A SCHEDULE FOR TEST PIT EXCAVATION PRIOR TO COMMENCING CONSTRUCTION. ADDITIONAL TEST PITS, SPECIFICALLY ORDERED BY THE ENGINEER, WILL ALSO BE PAID FOR UNDER THE APPROPRIATE BID ITEM.
11. FORCE MAIN SHALL BE LAID WITH CONTINUOUS ASCENDING GRADE WITH A SINGLE HIGH POINT AT THE APPROPRIATE DISCHARGE POINT.
12. CONTRACTOR'S ATTENTION IS DIRECTED TO SPECIFICATION SECTION 02210, "EARTH EXCAVATION, BACKFILL, FILL AND GRADING. COMPACTION REQUIREMENTS SPECIFIED WILL BE STRICTLY ADHERED TO.
13. ALL WORK UNDER THIS CONTRACT SHALL BE PERFORMED WITHIN THE RIGHT-OF-WAY OF RTE. 6 & 28 AND DEPOT STREET. THE CONTRACTOR SHALL NOT BE PERMITTED TO PERFORM WORK OUTSIDE THE RIGHT-OF-WAY UNLESS AUTHORIZED BY THE ENGINEER.
14. (2) WHERE A FORCE MAIN IS SHOWN PARALLEL TO A SEWER, THE CONTRACTOR MAY CONSTRUCT THE PIPELINES IN THE SAME TRENCH (DUAL PIPE TRENCH) BETWEEN THE FOLLOWING STATIONS:

FROM	TO	SHEET NO.S
0+00	5+30	2
46+85	54+25	5
0+80W	9+00W	11 AND 12

ALL OTHER AREAS WHERE A FORCE MAIN IS SHOWN PARALLEL TO A SEWER, EACH PIPELINE SHALL BE CONSTRUCTED IN SEPARATE TRENCHES HOLDING A MINIMUM DISTANCE OF 10 FEET BETWEEN THE CENTERLINES.



TYPICAL BORING PROFILE

NOTES:
1. REFER TO PLAN FOR APPROXIMATE BORING LOCATION. BORINGS PROFILE SHOWN ON PROFILE FOR REFERENCE.
2. "C" DENOTES CORING.
3. FOR SAMPLER TYPE, DRIVING WEIGHT AND STRATA DESCRIPTIONS, SEE BORING LOGS APPENDIX A - SPECIFICATIONS.
4. BIDDERS ATTENTION IS DIRECTED TO SUBSECTION 19.7 "INFORMATION NOT GUARANTEED".

RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
3	6/90	SD	A.C.L.	REVISED FOR THE RECORD
2	3-1-89	M.S.	T.A.S.	REVISED GENERAL NOTE 14
1	2/6/89	R.D.B.	T.A.S.	ADDED NOTE

REVISIONS

DRAWN BY: J.F. [signature]
DEPT. CHECK: J.E. [signature]
FINAL CHECK: T. Speain

STATE OF MAINE — ROBERT A. SCHERPP 5794 — REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS — THOMAS A. SPEARIN No. 27872 — REGISTERED PROFESSIONAL ENGINEER

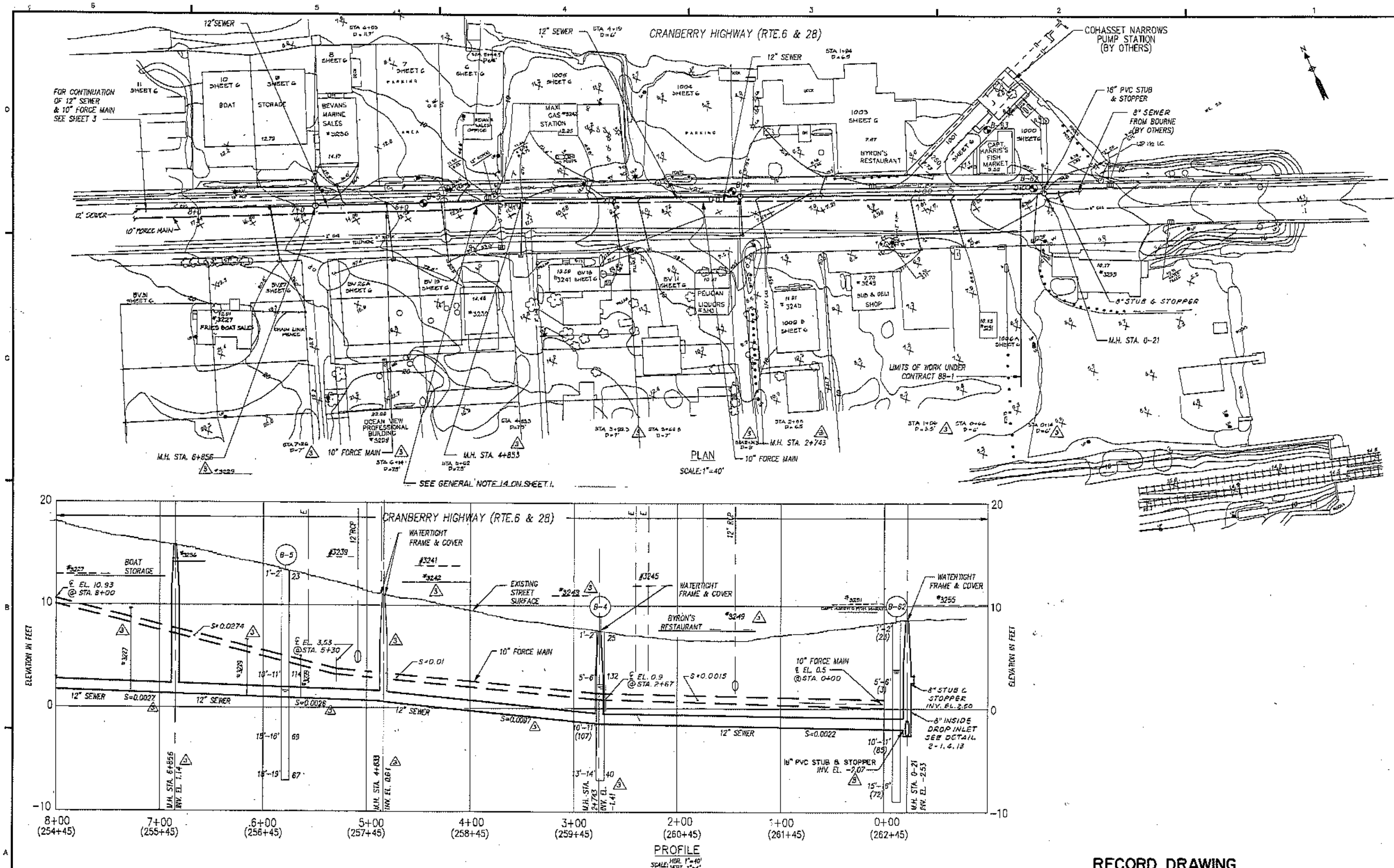
M&E METCALF & EDDY

Robert A. Scherpf — REG. PROF. ENGR. — 8/25/88
Thomas A. Spearin — REG. PROF. ENGR. — 9/1/88

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY INTERCEPTOR SEWERS AND FORCE MAINS
LOCATION PLAN, LEGEND, AND GENERAL NOTES

JOB 2995
FILE NO. H-89676-1
CONTRACT 88-1
SHEET 1 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
3	6-3-94	SD		REVISED FOR THE RECORD
2	2-28-89	LAM		REVISED FORCE MAIN PROFILE & ALIGNMENT
1	2-2-89	KML		REVISED PLAN AND PROFILE

CHNGS — REVISIONS

DRAWN BY J. POTENZA, K. LAVINE
DEPT. CHECK
PROJ. CHECK

STATE OF MAINE — ROBERT A. SCHERPF — REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS — THOMAS A. SPEARIN — PROFESSIONAL ENGINEER

M&E METCALF & EDDY

REG. PROF. ENGR. ME NO. 5794 — 6/22/88
REG. PROF. ENGR. MA NO. 27072 — 9/1/88 DATE

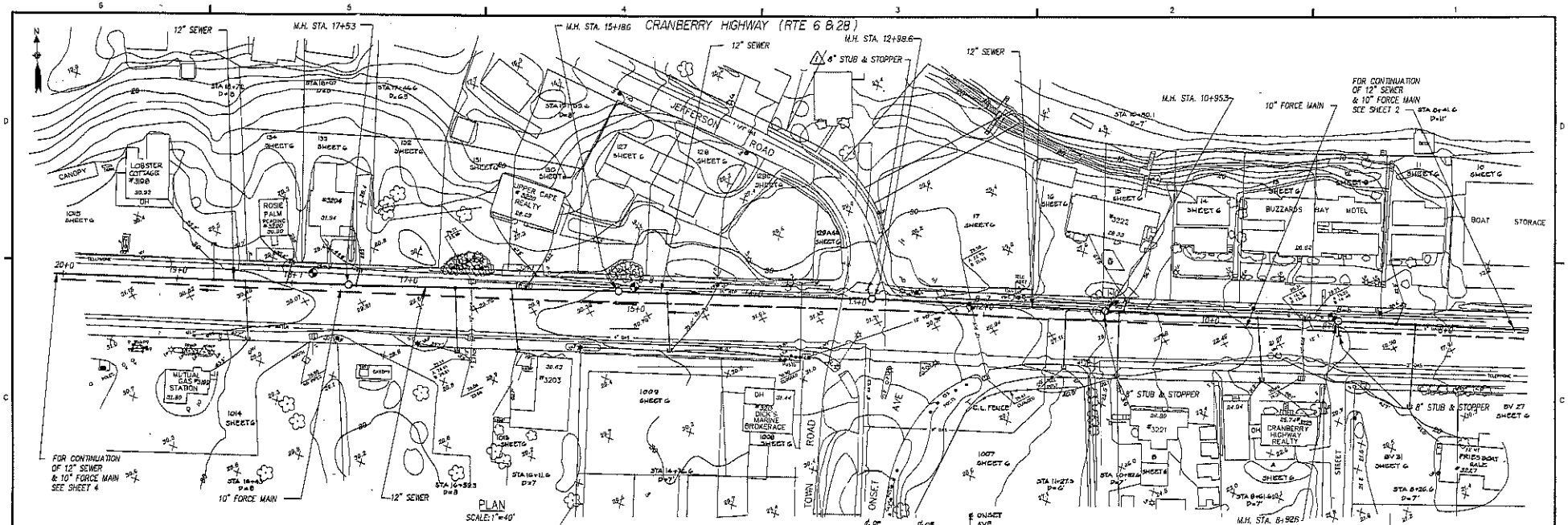
SCALE: AS SHOWN

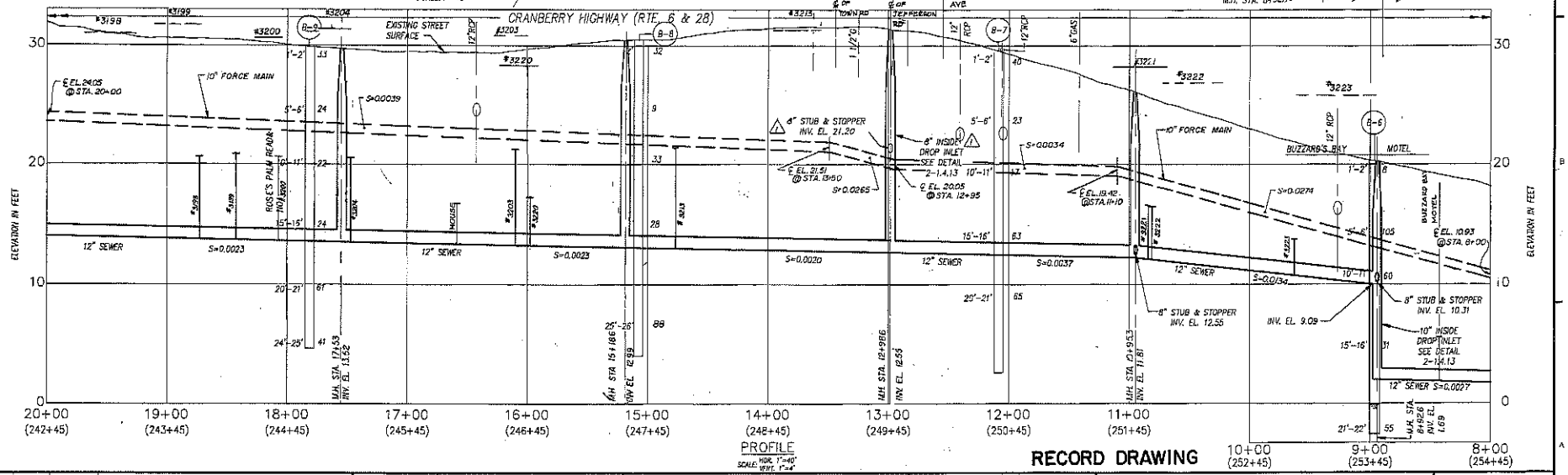
UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS & FORCE MAINS

CRANBERRY HIGHWAY STA. 0-21 TO STA. 8+00

JOB 2895
FILE NO. H-89677-1
CONTRACT 88-1
SHEET 2 OF 16





RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
3	6-7-94	S.D.		REVISED FOR THE RECORD
2	3-1-89	S.C.		REVISED FORCE MAIN PROFILE
1	2-3-89	KML		REVISED PLAN & PROFILE

FILE NO.

REVISIONS

DRAWN BY: K. LAVINE, J. POTENZA

DEPT. CHECK:

PUBLIC CHECK:

ROBERT A. SCHAPP, 3256, REGISTERED PROFESSIONAL ENGINEER, COMMONWEALTH OF MASSACHUSETTS

THOMAS A. SPEARIN, No. 37472, REGISTERED PROFESSIONAL ENGINEER, COMMONWEALTH OF MASSACHUSETTS

M&E METCALF & EDDY

ACC. PROF. ENGR. Robert A. Schapp, MS NO. 5764 — DATE 9/1/89

ACC. PROF. ENGR. Thomas A. Spearin, MA NO. 37472 — DATE 9/1/89

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED IN CHANGE BY REPRODUCTION

TOWN OF WAREHAM, MASSACHUSETTS

CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

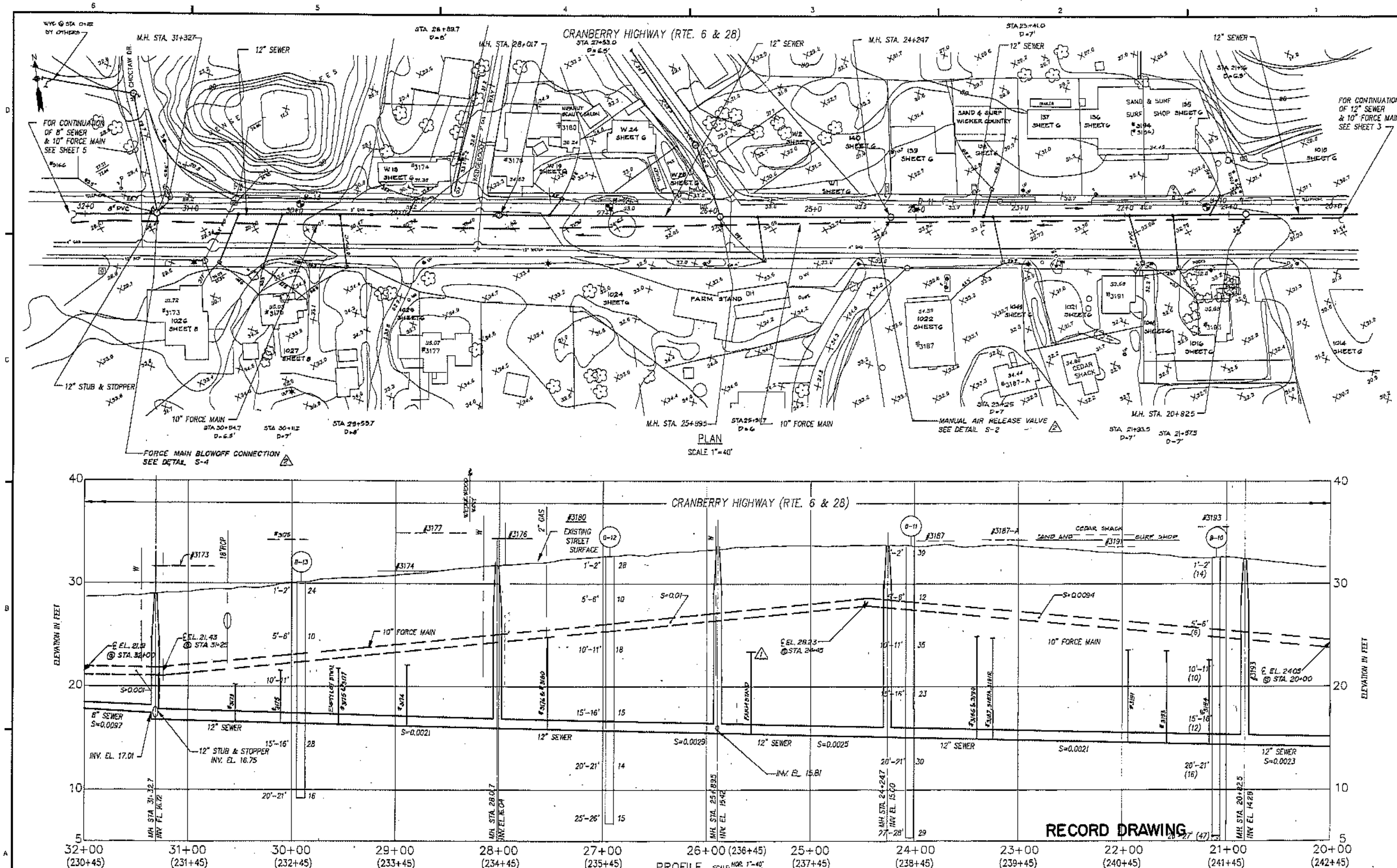
CRANBERRY HIGHWAY STA. 8+00 TO STA. 20+00

JOB 2995

FILE NO. H-89078-1

CONTRACT 85-1

SHEET 3 OF 15



NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
3	6-7-94	SD		REVISED FOR THE RECORD
2	3-1-89	S.C.	T.A.	REVISED FORCE MAIN PROFILE
1	2-3-89	KML	T.A.	REVISED PROFILE

REVISIONS

DRAWN BY: J. POTENZA, K. LAVINE
DEPT. CHECK
PROJ. CHECK

STATE OF MAINE — ROBERT A. BOHLSEN — 6794 — REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS — THOMAS A. SPEARIN — No. 27672 — REGISTERED PROFESSIONAL ENGINEER

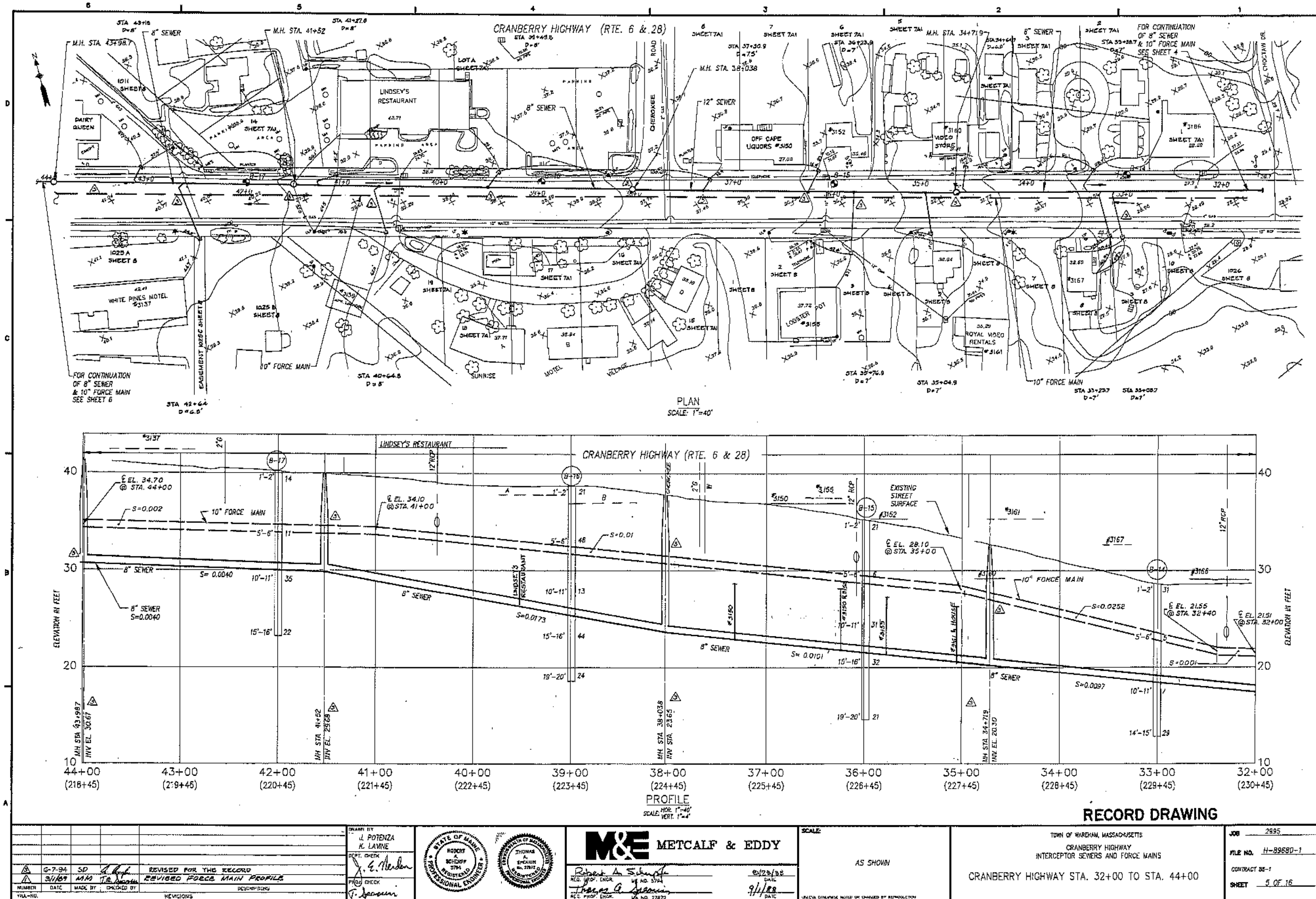
M&E METCALF & EDDY

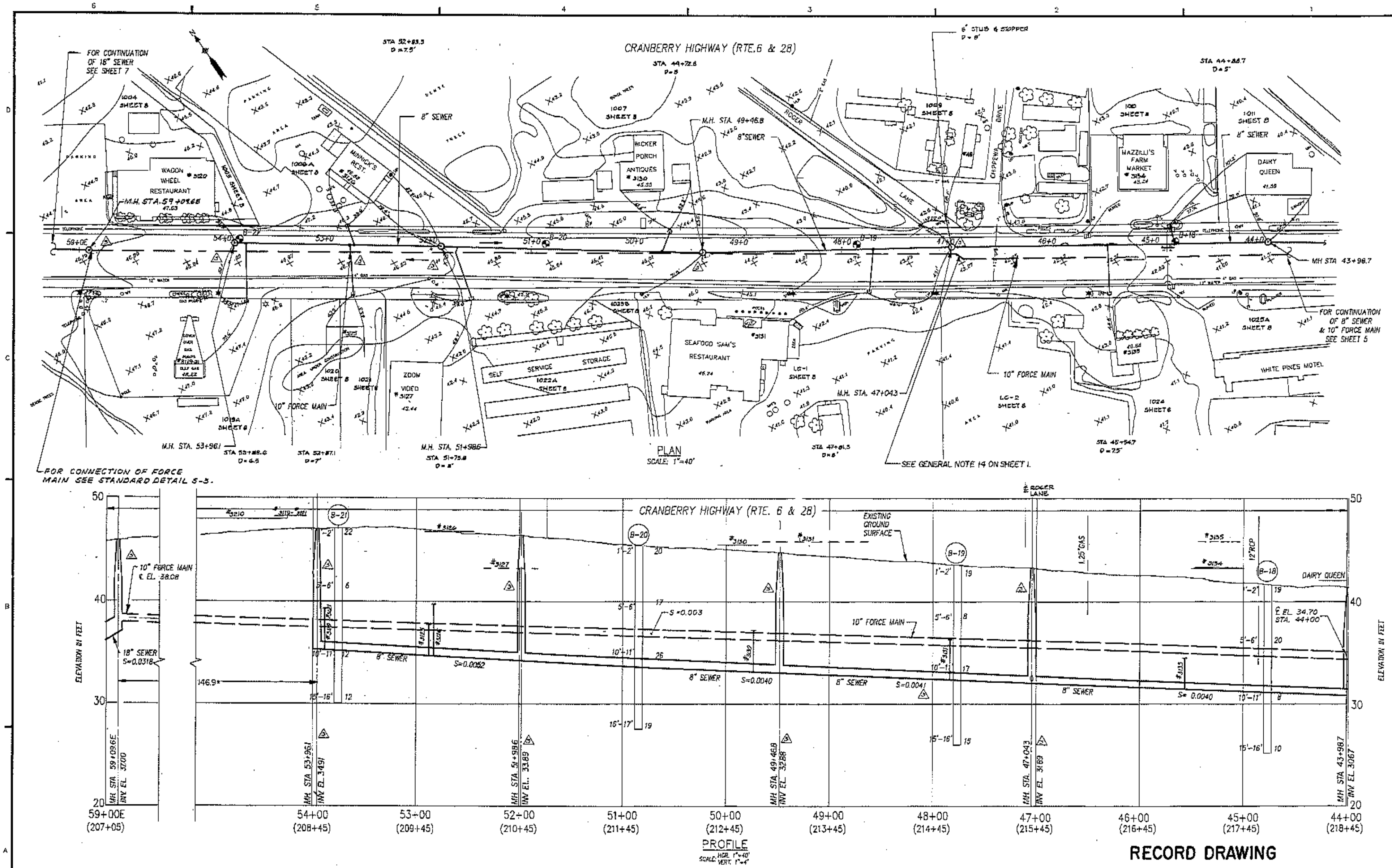
REG. PROF. ENGR. ME NO. 6794 — DATE 3/28/88
PCD. PROF. ENGR. MA NO. 27672 — DATE 9/1/88

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS
CRANBERRY HIGHWAY STA. 20+00 TO STA. 32+00

JOB 2995
FILE NO. H-83679-1
CONTRACT 88-1
SHEET 4 OF 16


CRANBERRY HIGHWAY (RTE. 6 & 28)
PLAN
SCALE: 1"=40'
PROFILE
SCALE: HOR. 1"=40' VERT. 1"=4'
ELEVATION IN FEET
FOR CONTINUATION OF 8" SEWER & 10" FORCE MAIN SEE SHEET 4
FOR CONTINUATION OF 8" SEWER & 10" FORCE MAIN SEE SHEET 6
LINDSEY'S RESTAURANT
OFF CAPE LIQUORS #3150
ROYAL VIDEO RENTALS #3161
WHITE PINES MOTEL #3137
DAIRY QUEEN
LOBSTER POT #3155
10" FORCE MAIN
8" SEWER
EXISTING STREET SURFACE
44+00 (218+45)
43+00 (219+45)
42+00 (220+45)
41+00 (221+45)
40+00 (222+45)
39+00 (223+45)
38+00 (224+45)
37+00 (225+45)
36+00 (226+45)
35+00 (227+45)
34+00 (228+45)
33+00 (229+45)
32+00 (230+45)
RECORD DRAWING
DRAWN BY J. POTENZA K. LAVINE
METCALF & EDDY
SCALE: AS SHOWN
TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS
CRANBERRY HIGHWAY STA. 32+00 TO STA. 44+00
JOB 2995
FILE NO. H-89680-1
CONTRACT 35-1
SHEET 5 OF 16
6-7-94 SD REVISED FOR THE RECORD
3/1/89 MM REVISED FORCE MAIN PROFILE
NUMBER DATE MADE BY CHECKED BY DESCRIPTION REVISIONS



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
2	6/09/94	SD	[signature]	REVISED FOR THE RECORD
1	2/28/89	MM	[signature]	REVISED FORCE MAIN PROFILE & ALIGNMENT

FILE NO. — REVISIONS

DRAWN BY: J. POTENZA, K. LAVINE
DEPT. CHECK: J. E. Nerden
PROJ. CHECK: T. Jasonis

METCALF & EDDY

Robert A. Schopf — REG. PROF. ENGR. — 5/28/85
Thomas A. Jasonis — REG. PROF. ENGR. — 9/1/88

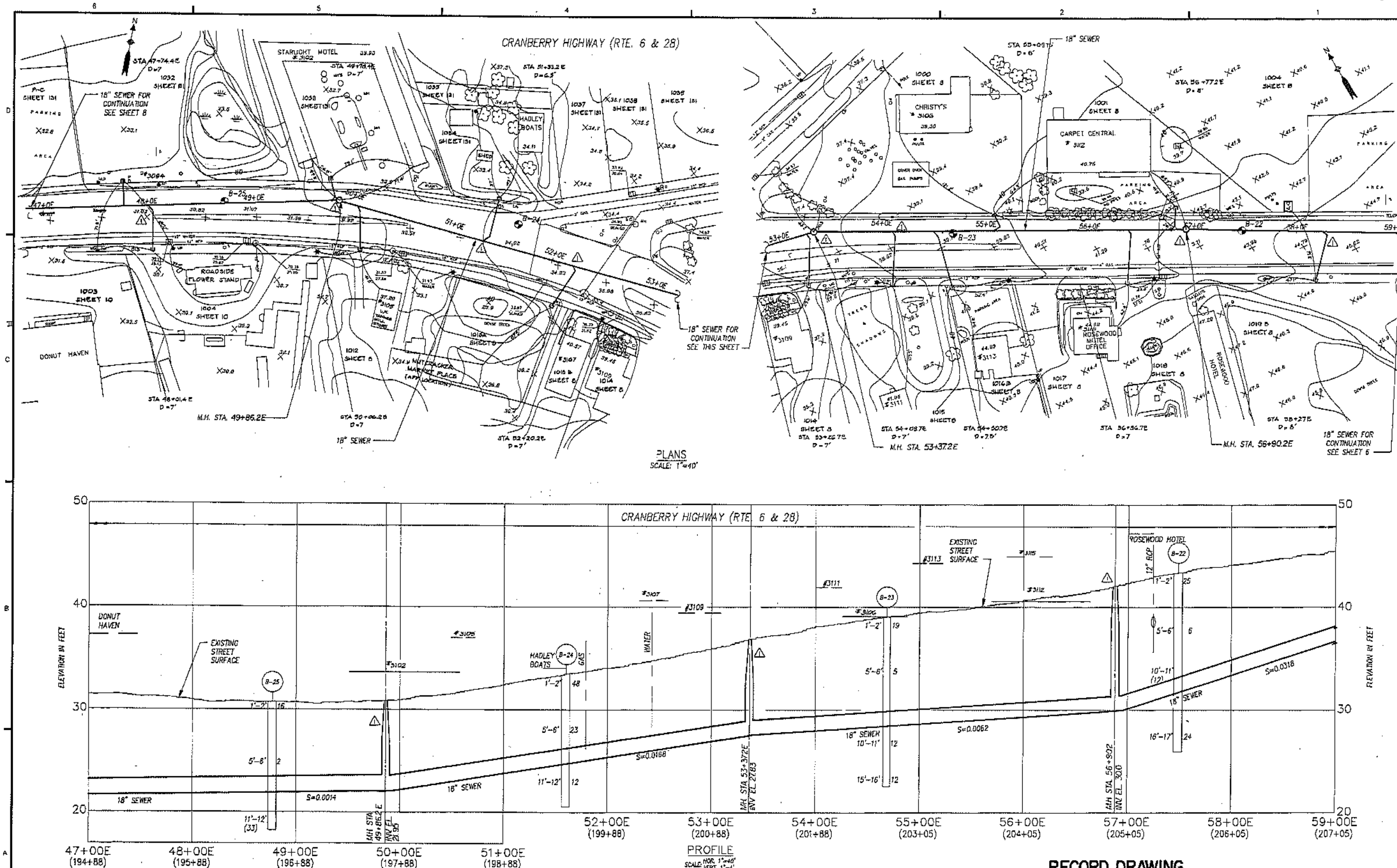
SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

CRANBERRY HIGHWAY STA. 44+00 TO STA. 54+25 AND STA. 59+00E TO STA. 59+15E

JOB 2895
FILE NO. 11-89681-1
CONTRACT 85-1
SHEET 6 OF 16



RECORD DRAWING

1	6/94	S.D.		REVISED FOR THE RECORD
NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
FILE-NO.				REVISIONS

DRAWN BY: J. POTENZA, K. LAVINE
DEPT. CHECK: J. E. Norden
PROJ. CHECK: T. Spearin

M&E METCALF & EDDY

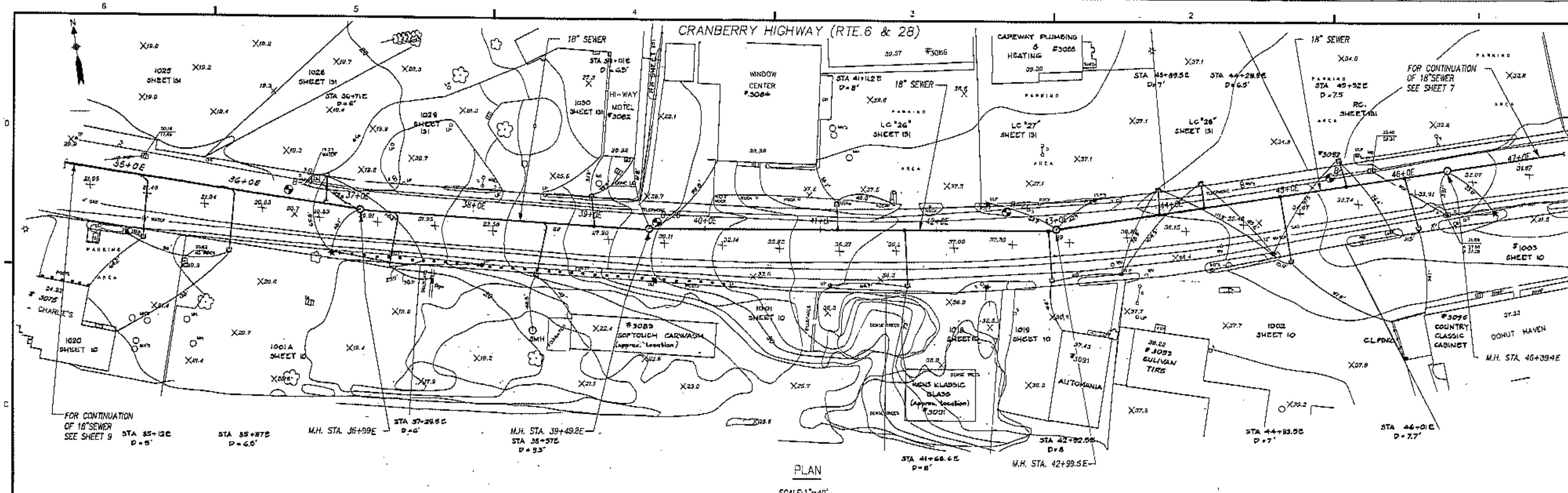
Robert A. Schaeffer — REG. PROF. ENGR. No. 6794 — 8/28/89
Thomas A. Spearin — REG. PROF. ENGR. No. 27672 — 9/1/89

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

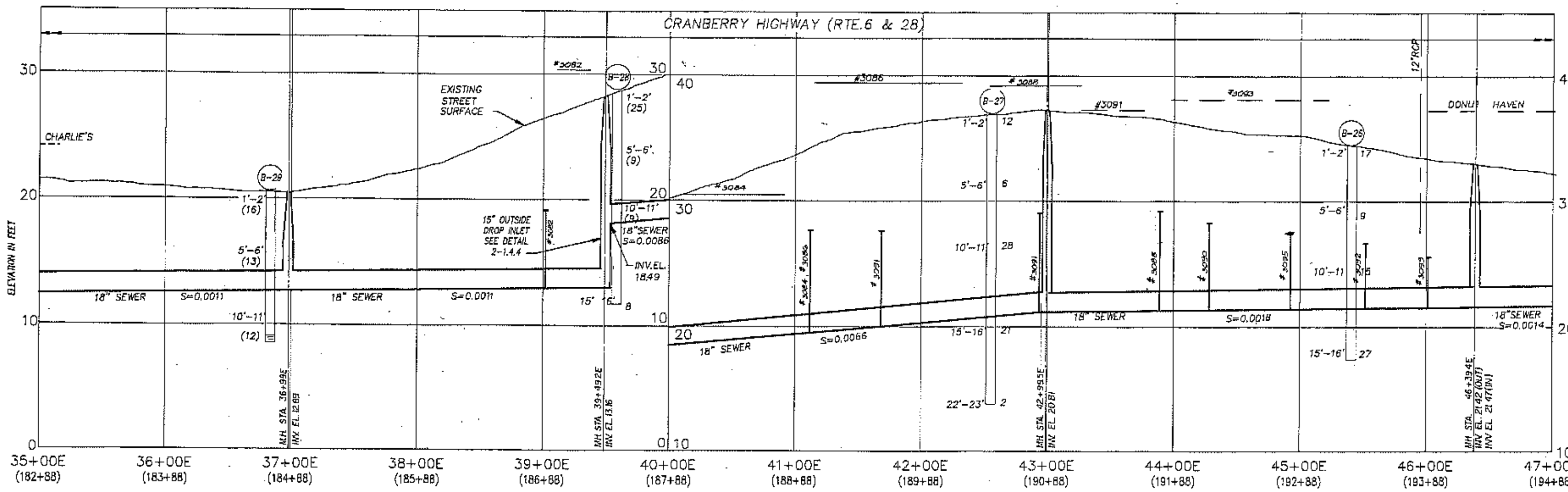
CRANBERRY HIGHWAY STA. 47+00E TO STA. 59+00E

JOB 2995
FILE NO. H-89682-1
CONTRACT 88-1
SHEET 7 OF 16



PLAN

SCALE: 1"=40'



PROFILE

SCALE: HOR. 1"=40' VERT. 1"=4'

RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTION
2	6-13-94	J.P.	[signature]	REVISED FOR THE RECORD
1	3-1-89	M.M.	[signature]	ADDED CHIMNEYS

REVISIONS

DRAWN BY J.POTENZA

DEPT. CHECK J.G. Norden

PROJ. CHECK T. Jassain

STATE OF MAINE ROBERT A. SCHEPPF 5794 REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS THOMAS A. SPEARIN No. 27672 REGISTERED PROFESSIONAL ENGINEER

M&E METCALF & EDDY

Robert A. Scheppf — REG. PROF. ENGR. ME REG. 5794 — 5/23/88 DATE

Thomas A. Spearin — REG. PROF. ENGR. MA NO. 27672 — 9/1/88 DATE

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

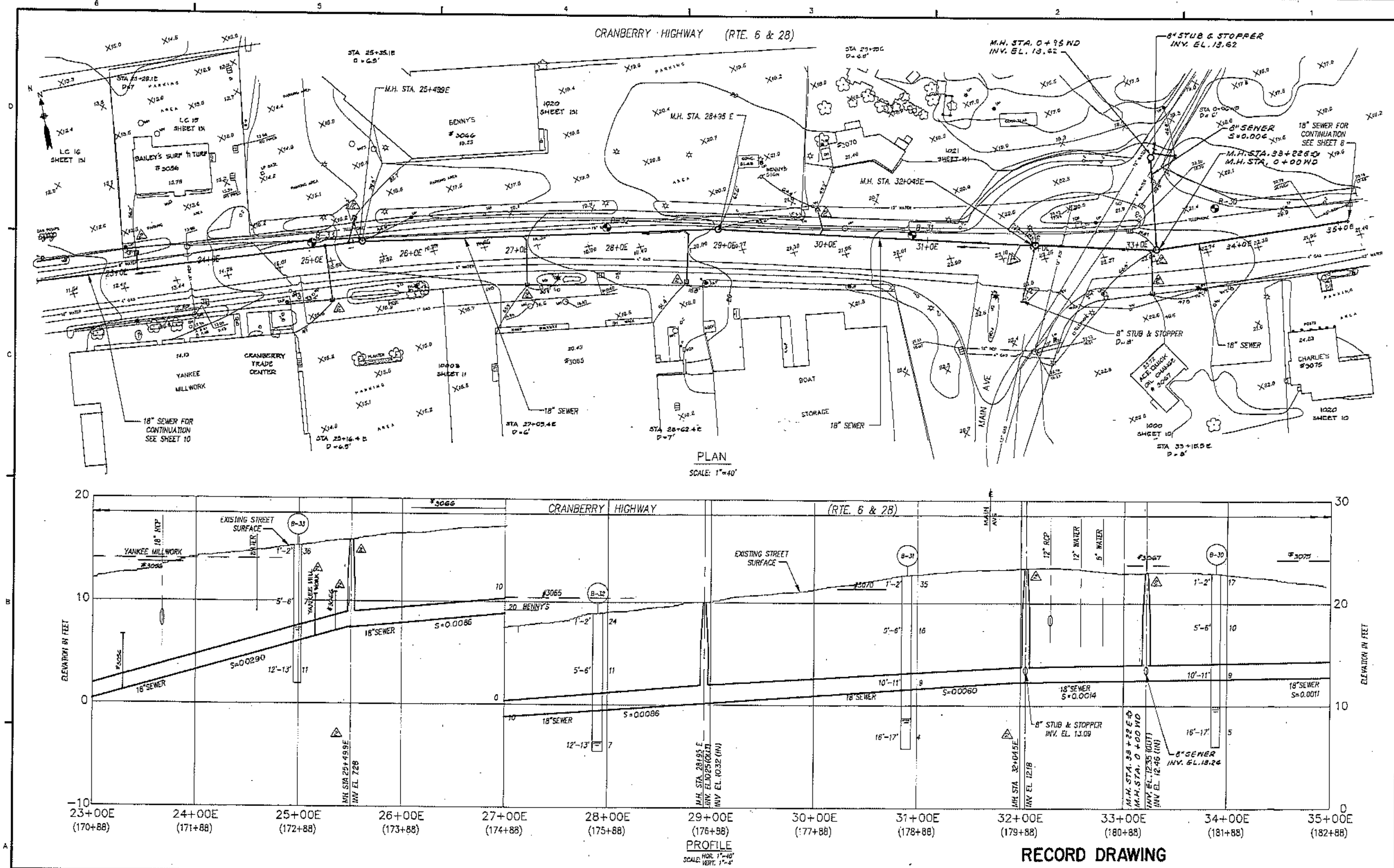
CRANBERRY HIGHWAY STA. 35+00E TO STA. 47+00E

JOB 2995

FILE NO. H-89683-1

CONTRACT 88-1

SHEET 8 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
2	6-15-94	ED		REVISED FOR THE RECORD
1	2-2-89	KML		REVISED SEWER IN PLAN

REVISIONS

DRAWN BY J. POTENZA, K. LAVINE
DEPT. CHECK J. E. Merden
FULL CHECK T. Jasmin

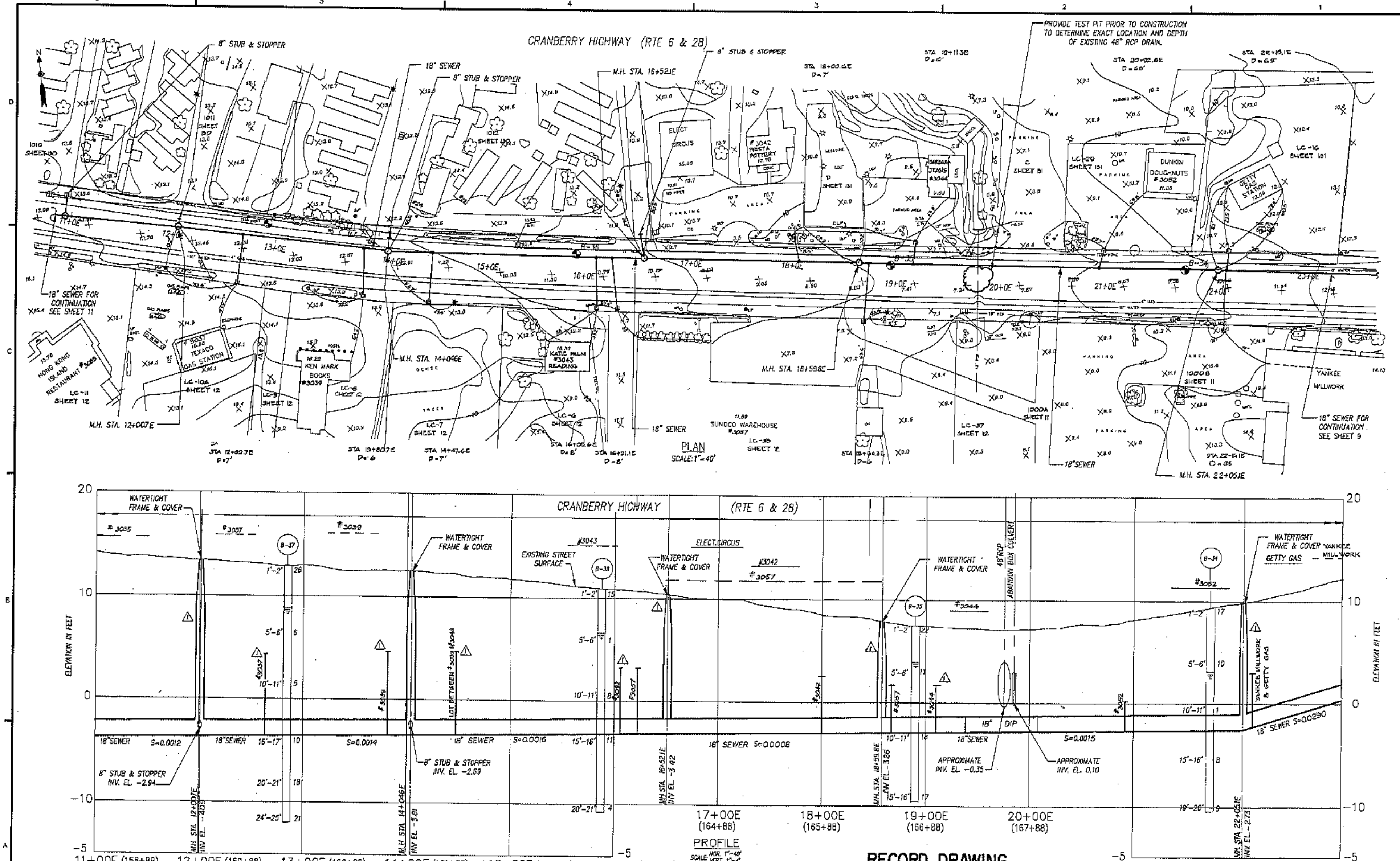
METCALF & EDDY

Robert A. Schepf — REG. PROF. ENGR. — REG. NO. 5794 — 3/26/88 DATE
Thomas A. Jasmin — REG. PROF. ENGR. — REG. NO. 27672 — 9/1/88 DATE

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS
CRANBERRY HIGHWAY STA. 23+00E TO STA. 35+00E

JOB 2995
FILE NO. H-89685-1
CONTRACT 88-1
SHEET 9 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
1	6-15-94	SD		REVISED FOR THE RECORD

REVISIONS

DRAWN BY J. POTENZA, K. LAVINE

DEPT. CHECK

PROJ. CHECK

METCALF & EDDY

REG. PROF. ENGR. ME NO. 5704 — 8/26/88

REG. PROF. ENGR. MASS. NO. 27872 — 7/1/88

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS

CRANBERRY HIGHWAY

INTERCEPTOR SEWERS AND FORCE MAINS

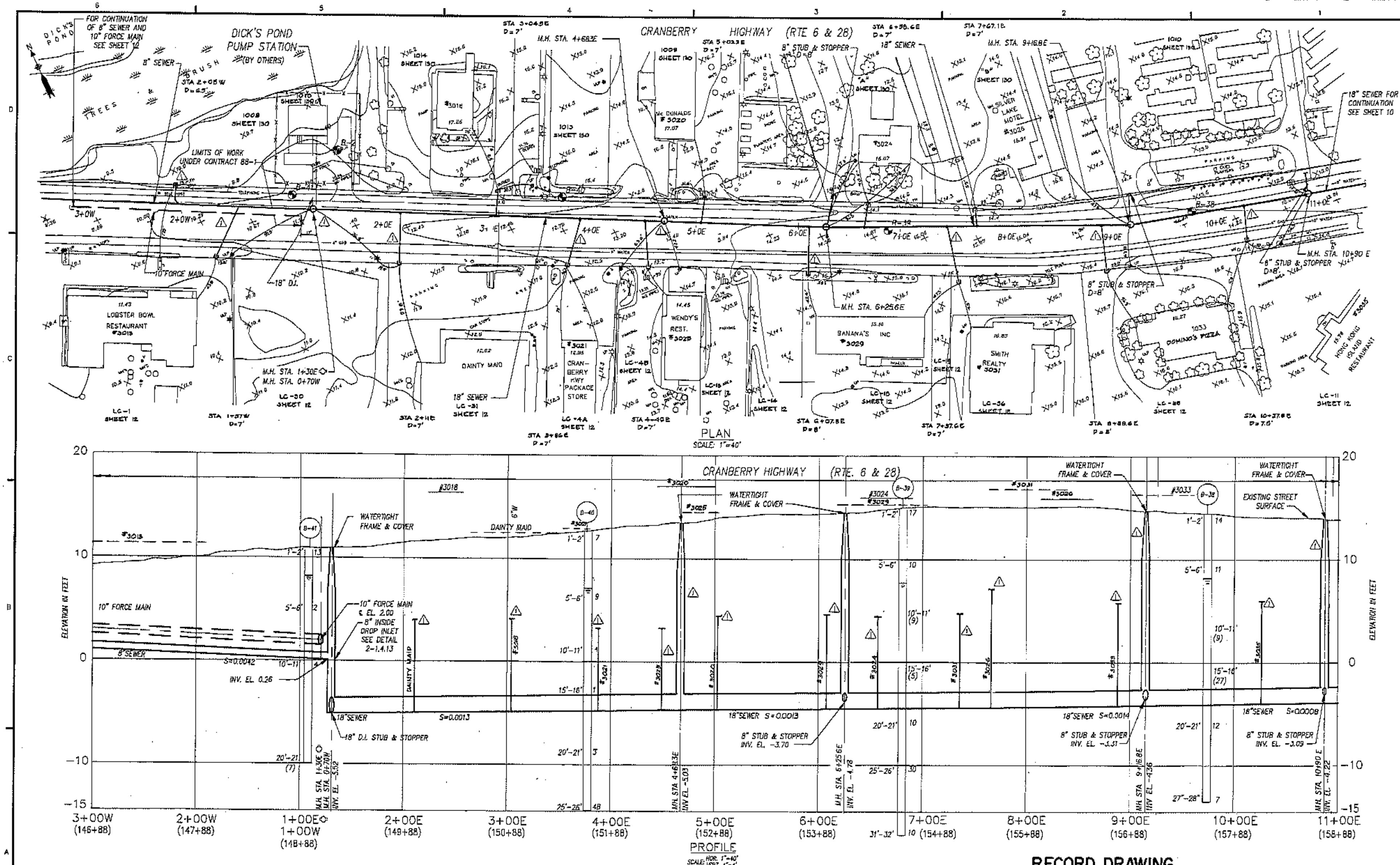
CRANBERRY HIGHWAY STA. 11+00E TO STA. 23+00E

JOB 2995

FILE NO. H-89686-1

CONTRACT 88-1

SHEET 10 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
1	6-13-94	SD		REVISED FOR THE RECORD

REVISIONS

DRAWN BY K. LOVINE, J. POTENZA

DEPT. CHECK

PROJ. CHECK

METCALF & EDDY

REG. PROF. ENGR. ME NO. 5794 — 8/28/88

REG. PROF. ENGR. MA NO. 27672 — 9/1/88

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS

CRANBERRY HIGHWAY

INTERCEPTOR SEWERS AND FORCE MAINS

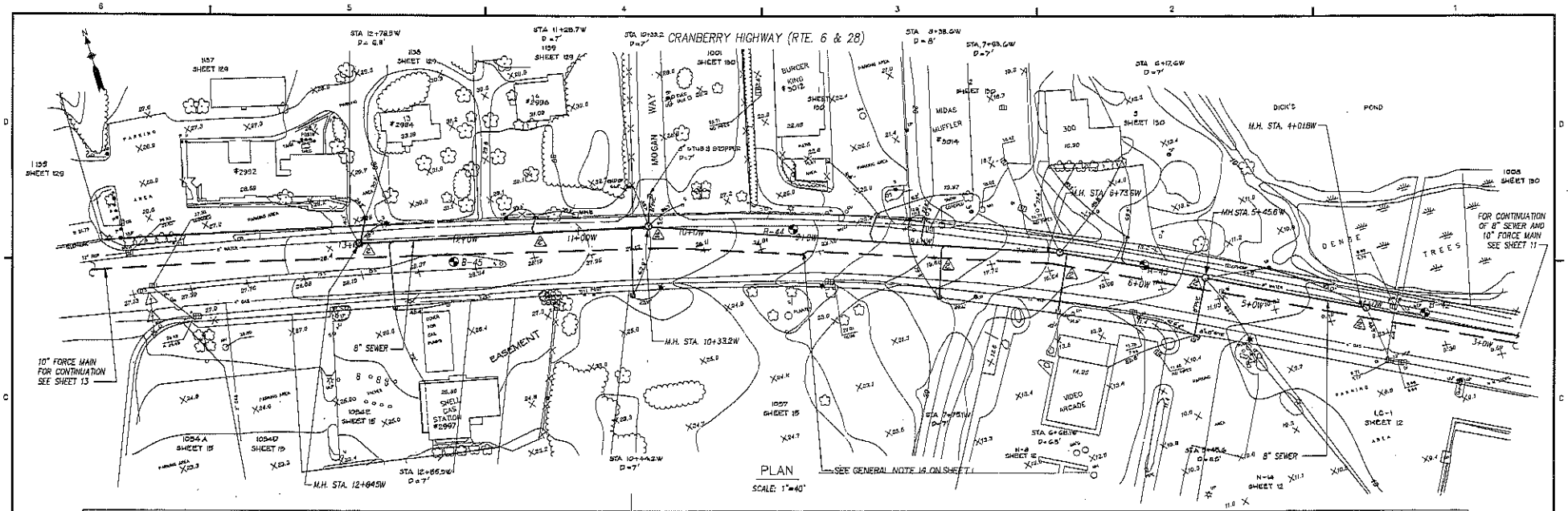
CRANBERRY HIGHWAY STA. 1+30E TO STA. 11+00E AND STA. 0+70W TO STA. 3+00W

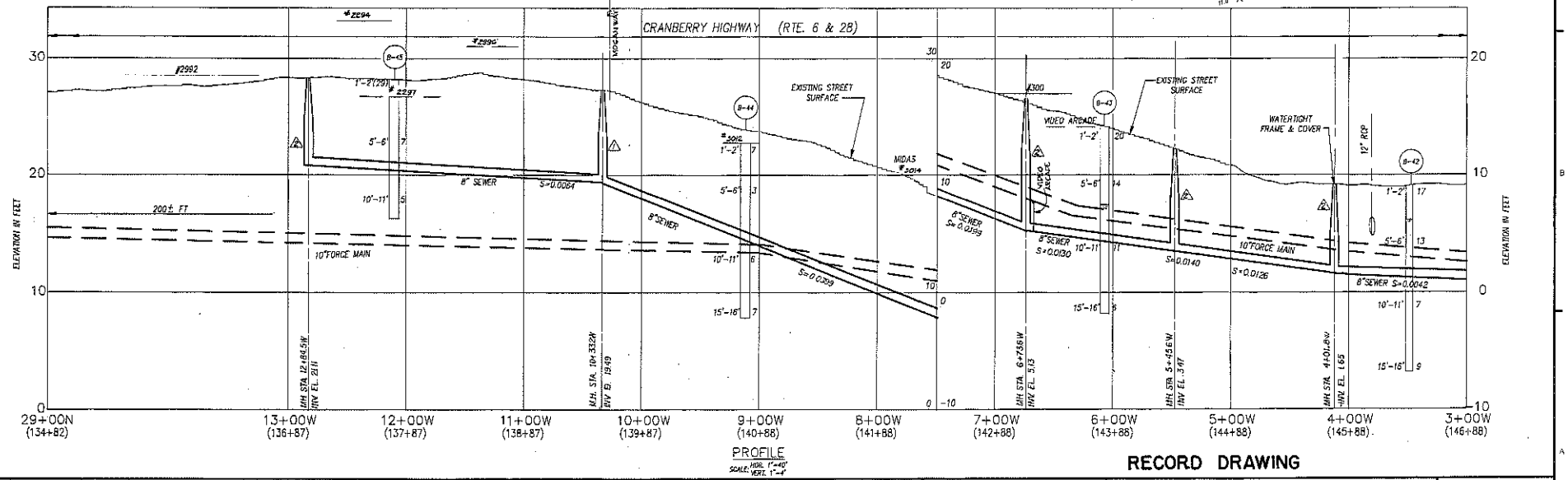
JOB 2095

FILE NO. H-89687-1

CONTRACT 88-1

SHEET 11 OF 16





PROFILE
SCALE: HOR. 1"=40' VERT. 1"=4'

RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
2	6-16-94	SD		REVISED FOR THE RECORD
1	3/2/89	K. CARTER	T.D. Sacramone	REVISED ALIGNMENT OF FORCE MAIN

FILE NO.

REVISIONS

DRAWN BY: K. LOVINE, J. POTENZA
RIGHT CHECK: J. F. Mullen
FINAL CHECK: T. Sacramone

STATE OF MAINE — ROBERT E. SCHOPP — 3774 — REGISTERED PROFESSIONAL ENGINEER

THOMAS D. SACRAMONE — 21622 — REGISTERED PROFESSIONAL ENGINEER

M&E METCALF & EDDY

REG. PROF. ENGR. — ME NO. 3774 — 8/20/88 DATE

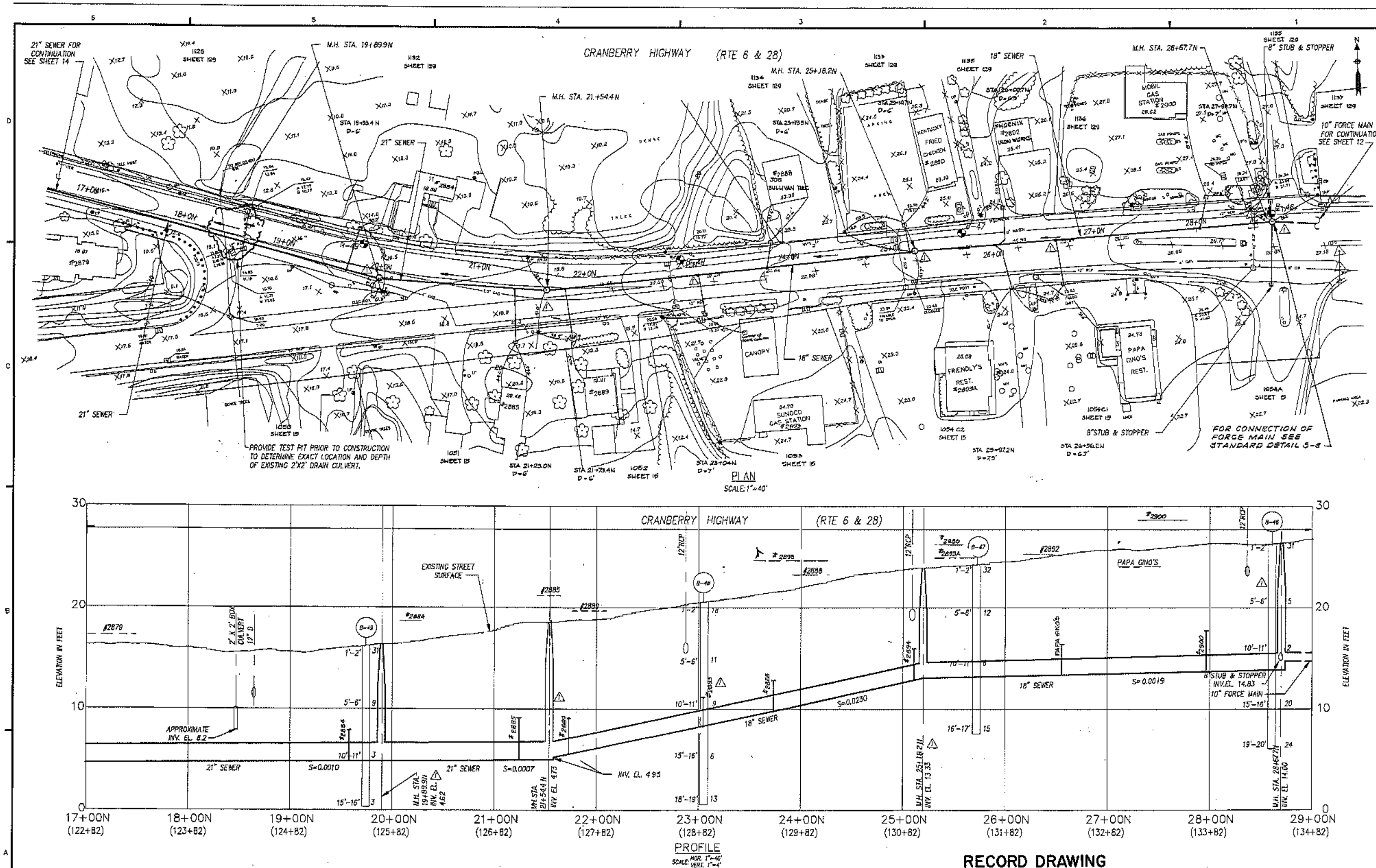
REG. PROF. ENGR. — MASS. NO. 21622 — 9/1/88 DATE

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR SHOWN BY FORMULATION

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS
CRANBERRY HIGHWAY STA. 3+00W TO STA. 13+05W

JOB 7995
FILE NO. H-89688-1
CONTRACT 88-1
SHEET 12 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
1	6-17-94	SP		REVISED FOR THE RECORD

REVISIONS

DRAWN BY K. LAVINE, J. POTENZA

METCALF & EDDY

REG. PROF. ENGR. 8/28/88

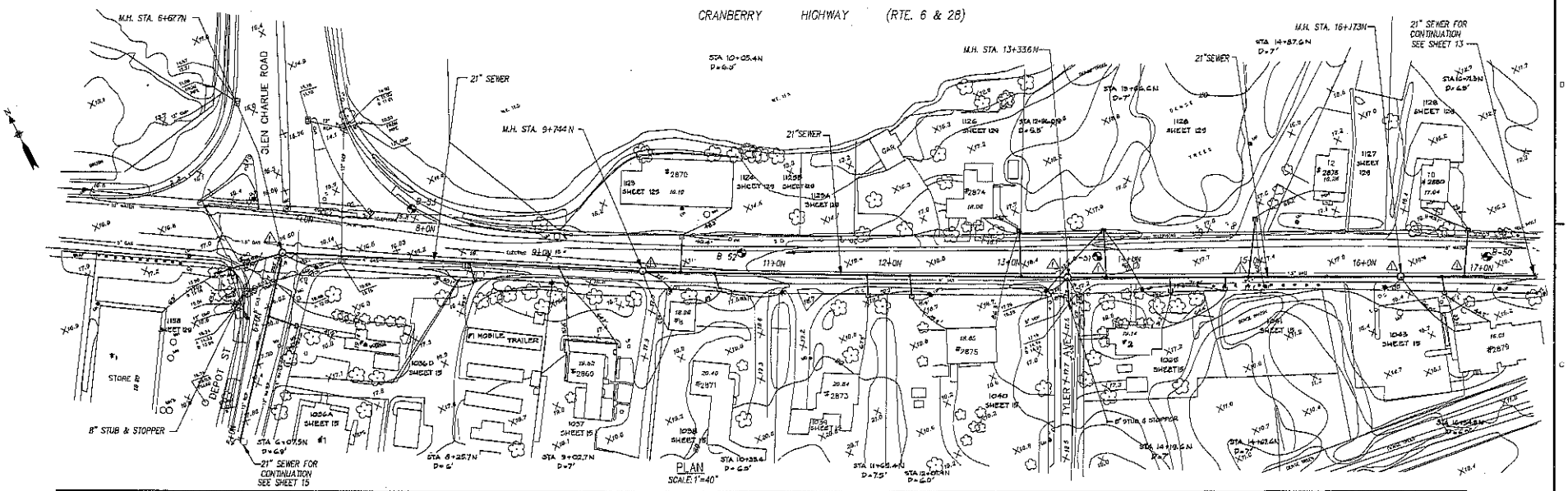
REG. PROF. ENGR. 9/1/88

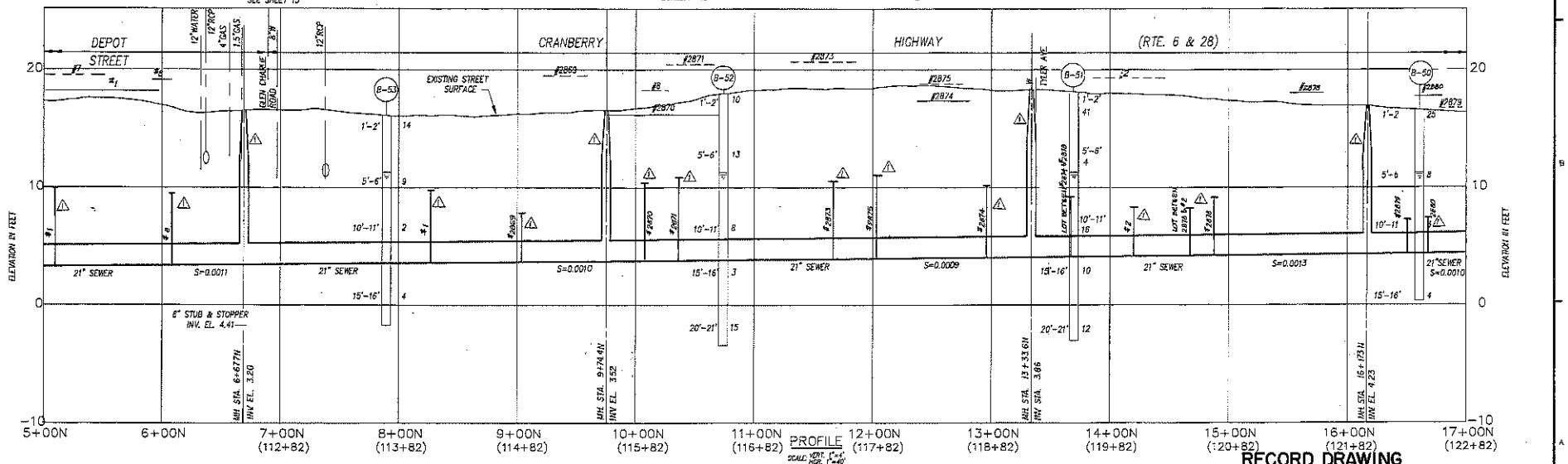
SCALE: AS SHOWN

TOWN OF WAREHAM
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

CRANBERRY HIGHWAY STA. 17+00N TO STA. 29+00N

JOB 2995
FILE NO. H-89689-1
CONTRACT 88-1
SHEET 13 OF 16





RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
1	6-17-93	SO		REVISED FOR THE RECORD

FILE NO. — REVISIONS

DRAWN BY: J. POTENZA, K. LAVINE
DEPT. CHECK:
PROJ. CHECK:

STATE OF MAINE — ROBERT A. SCHNUPP — 6734 — REGISTERED PROFESSIONAL ENGINEERS

COMMONWEALTH OF MASSACHUSETTS — THOMAS A. SPOSINI — NO. 27672 — REGISTERED PROFESSIONAL ENGINEER

METCALF & EDDY

Robert A. Schnupp — REG. PROF. ENGR. — ME NO. 6734 — 8/26/88 DATE

Thomas A. Sposini — REG. PROF. ENGR. — MASS NO. 27672 — 9/1/88 DATE

SCALE: AS SHOWN

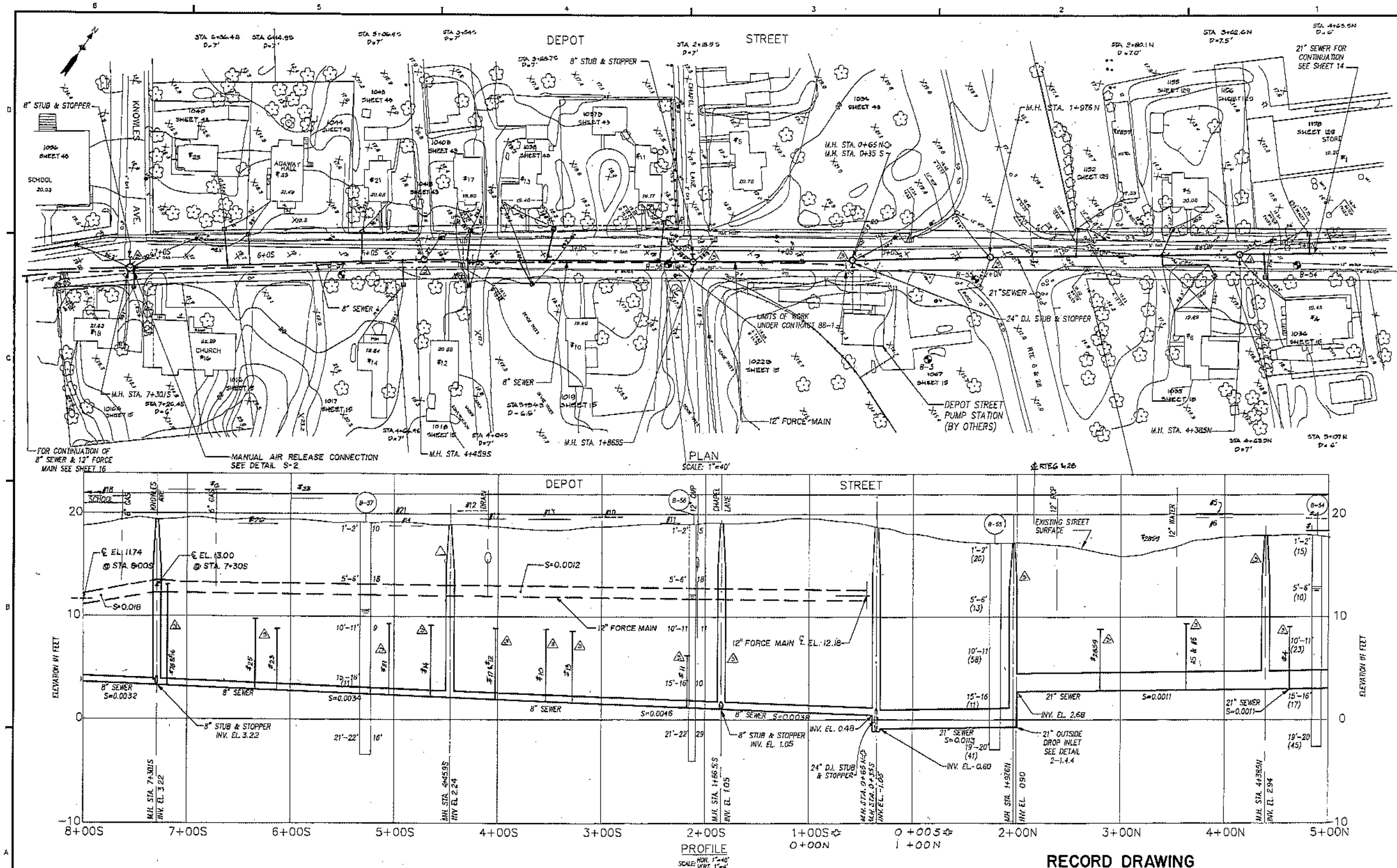
UNLESS OTHERWISE NOTED OR SHOWN AT INTRODUCTION

TOWN OF WAREHAM, MASSACHUSETTS

CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

DEPOT STREET TO CRANBERRY HIGHWAY
STA. 5+00N TO STA. 17+00N

JOB 2835
FILE NO. H-89690-1
CONTRACT 88-1
SHEET 14 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
3	6-20-94	SD		REVISED FOR THE RECORD
2	3/2/89	COTE		REVISED FORCE MAIN ALIGNMENT & PROFILE
1	2-2-89	KML		REVISED PLAN & PROFILE

REVISIONS

FILE NO.

DRAWN: R. LAVINE, J. POTENZA

DEPT. CHECK

PROJ. CHECK

METCALF & EDDY

REG. PROF. ENGR. MA. NO. 37094 — 8/23/88

REG. PROF. ENGR. MASS. NO. 37072 — 9/1/88

SCALE: AS SHOWN

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

TOWN OF WAREHAM, MASSACHUSETTS

CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

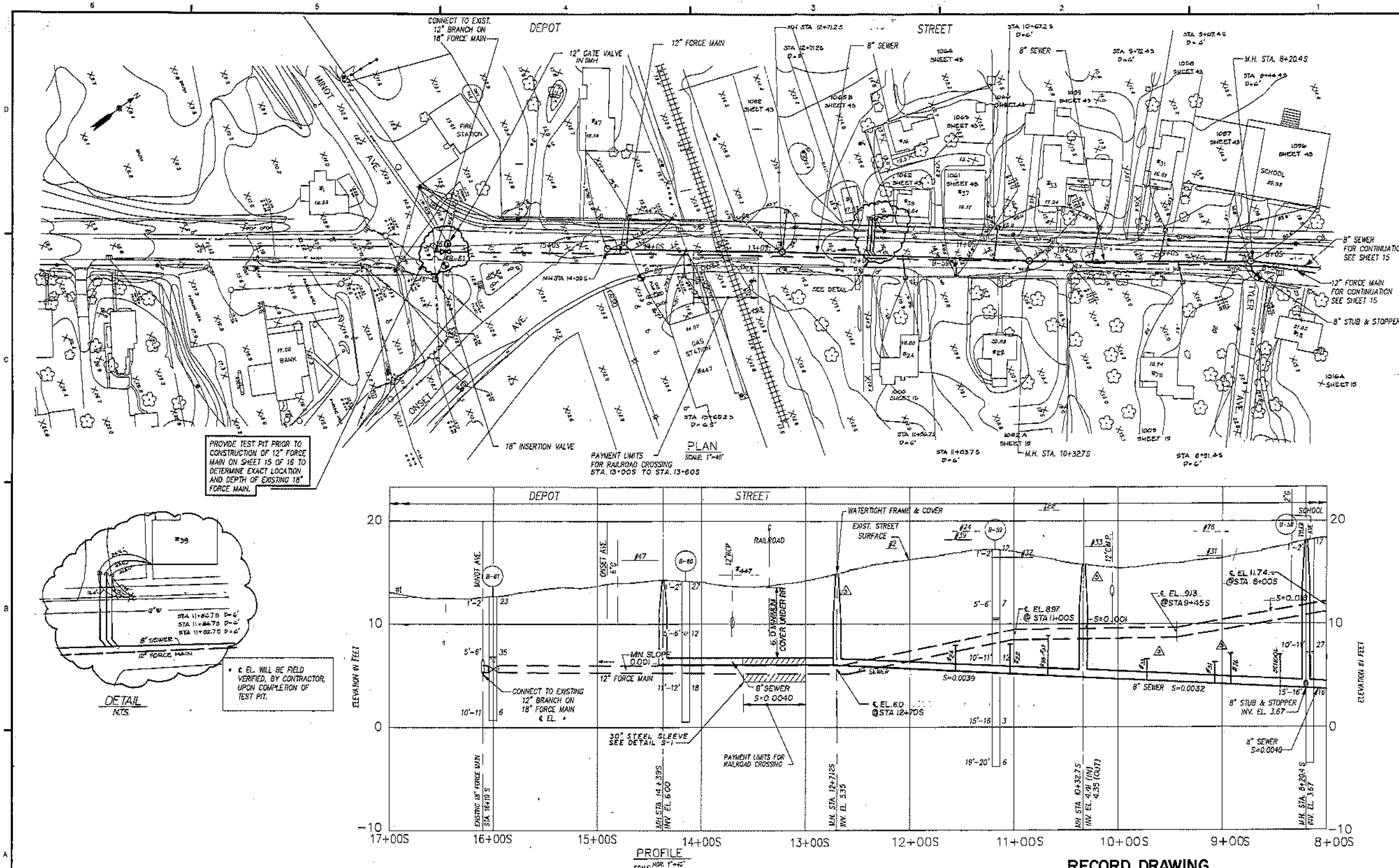
DEPOT STREET STA. 0+65N TO STA. 5+00N
AND STA. 0+35S TO STA. 8+00S

JOB 2995

FILE NO. H-89691-1

CONTRACT 88-1

SHEET 15 OF 16



RECORD DRAWING

NUMBER	DATE	MADE BY	CHECKED BY	DESCRIPTIONS
3	6-20-94	J.O.		REVISED FOR THE RECORD
2	4/20/89	J. Potenza		ADDED NOTES TO RAILROAD CROSSING
1	3/2/89	K. CARTER		REVISED FORCE MAIN ALIGNMENT & PROFILE

REVISIONS

DRAWN BY K. LAVINE J. POTENZA
DEPT. CHECK
PROJ. CHECK

M&E METCALF & EDDY

SCALE: AS SHOWN

TOWN OF WAREHAM, MASSACHUSETTS
CRANBERRY HIGHWAY
INTERCEPTOR SEWERS AND FORCE MAINS

DEPOT STREET STA. 8+00S TO STA. 16+10S

JOB 2995
FILE NO. H-89692-1
CONTRACT 88-1
SHEET 16 OF 16

Attachment D: Pump Station Run Times and Flow Rates

Daily Runtime Summary
Minutes and Gallons

Jump to: Apple St. Pump Station Go

Devices: Depot St

Time	Pump 1		Pump 2		Multiple		Total	
	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons
14 Jun	67.1	93940	81.8	114543	0.0	0	148.9	208483
13 Jun	151.7	212380	148.0	207130	0.0	0	299.7	419510
12 Jun	148.8	208297	145.2	203210	0.0	0	293.9	411507
11 Jun	161.4	225937	156.8	219543	0.0	0	318.2	445480
10 Jun	165.2	231257	166.7	233357	0.0	0	331.9	464613
09 Jun	164.3	230043	163.0	228200	0.0	0	327.3	458243
08 Jun	116.3	162867	232.8	325920	0.0	0	349.1	488787
07 Jun	179.2	250833	179.9	251860	1.7	0	359.1	502693
06 Jun	147.7	206710	148.9	208460	0.0	0	296.6	415170
05 Jun	146.3	204773	146.2	204610	0.0	0	292.4	409383
04 Jun	156.7	219380	156.4	219007	0.0	0	313.1	438387
03 Jun	166.5	233053	165.9	232190	0.0	0	332.3	465243
02 Jun	161.9	226613	159.1	222763	0.0	0	321.0	449377
01 Jun	145.8	204120	144.0	201623	0.0	0	289.8	405743
31 May	151.0	211400	146.7	205333	0.0	0	297.7	416733
30 May	153.0	214177	147.7	206803	0.0	0	300.7	420980
29 May	156.0	218353	150.4	210560	0.0	0	306.4	428913
28 May	165.7	232003	176.1	246540	0.0	0	341.8	478543
27 May	174.7	244533	167.4	234337	0.0	0	342.1	478870
26 May	170.8	239097	166.1	232493	0.0	0	336.9	471590
25 May	157.1	219940	150.8	211097	0.0	0	307.9	431037
24 May	155.5	217747	150.8	211097	0.0	0	306.3	428843
23 May	149.3	209020	147.0	205800	0.0	0	296.3	414820
22 May	146.2	204703	141.3	197843	0.0	0	287.5	402547
21 May	153.4	214760	148.0	207153	0.0	0	301.4	421913
20 May	172.4	241337	166.1	232540	0.0	0	338.5	473877
19 May	153.3	214620	151.5	212100	0.0	0	304.8	426720
18 May	157.1	219893	151.8	212497	0.0	0	308.9	432390
17 May	153.5	214923	148.8	208273	0.0	0	302.3	423197
16 May	150.1	210187	146.2	204680	0.0	0	296.3	414867
15 May	149.2	208880	146.7	205333	0.0	0	295.9	414213
14 May	148.5	207830	144.3	201950	0.0	0	292.7	409780
13 May	161.7	226380	158.4	221713	0.0	0	320.1	448093
12 May	167.5	234477	162.9	228037	0.0	0	330.4	462513
11 May	156.2	218610	151.3	211843	0.0	0	307.5	430453
10 May	152.4	213360	147.6	206570	0.0	0	300.0	419930
09 May	157.3	220267	153.6	214970	0.0	0	310.9	435237
08 May	156.2	218633	154.5	216230	0.0	0	310.6	434863
07 May	160.8	225097	157.8	220850	0.0	0	318.5	445947
06 May	168.0	235153	161.7	226427	0.0	0	329.7	461580
05 May	172.8	241943	170.8	239120	0.0	0	343.6	481063
04 May	163.9	229483	158.3	221620	0.0	0	322.2	451103
03 May	160.3	224443	157.6	220663	0.0	0	317.9	445107
02 May	159.9	223860	156.2	218680	0.0	0	316.1	442540
01 May	167.5	234500	162.4	227360	0.0	0	329.9	461860
30 Apr	173.7	243227	167.1	233917	0.0	0	340.8	477143
29 Apr	188.9	264390	184.2	257810	0.0	0	373.0	522200
28 Apr	191.5	268147	188.0	263130	0.0	0	379.5	531277
27 Apr	188.4	263690	179.6	251393	0.0	0	367.9	515083
26 Apr	179.1	250693	174.7	244533	0.0	0	353.7	495227
25 Apr	163.5	228947	161.1	225517	0.0	0	324.6	454463
24 Apr	149.6	209417	148.7	208203	0.0	0	298.3	417620
23 Apr	159.5	223277	155.2	217303	0.0	0	314.7	440580
22 Apr	169.5	237323	164.3	230067	0.0	0	333.9	467390
21 Apr	163.8	229297	160.7	224957	0.0	0	324.5	454253
20 Apr	165.2	231303	163.8	229250	0.0	0	329.0	460553
19 Apr	156.8	219497	151.5	212100	0.0	0	308.3	431597
18 Apr	165.6	231840	158.0	221223	0.0	0	323.6	453063
17 Apr	162.2	227010	162.2	227127	0.0	0	324.4	454137
16 Apr	160.7	224980	154.7	216580	0.0	0	315.4	441560
15 Apr	152.4	213313	150.8	211097	0.0	0	303.2	424410
14 Apr	171.2	239680	167.3	234173	0.0	0	338.5	473853
13 Apr	151.4	211960	149.7	209603	0.0	0	301.1	421563
12 Apr	154.3	215973	153.2	214527	0.0	0	307.5	430500
11 Apr	157.3	220173	150.1	210140	0.0	0	307.4	430313
10 Apr	152.5	213477	152.7	213803	0.0	0	305.2	427280
09 Apr	157.7	220733	162.4	227313	0.0	0	320.0	448047
08 Apr	164.6	230440	163.2	228457	0.0	0	327.8	458897
07 Apr	171.9	240707	164.8	230650	0.0	0	336.7	471357
06 Apr	164.2	229810	160.4	224583	0.0	0	324.6	454393
05 Apr	164.7	230557	156.5	219030	0.0	0	321.1	449587
04 Apr	163.6	229087	159.7	223533	0.0	0	323.3	452620
03 Apr	162.0	226753	158.3	221667	0.1	0	320.3	448420
02 Apr	164.0	229647	157.8	220850	0.0	0	321.8	450497
01 Apr	163.1	228340	157.5	220500	0.0	0	320.6	448840
31 Mar	177.0	247800	179.0	250647	0.0	0	356.0	498447
30 Mar	177.3	248243	170.7	238957	0.0	0	348.0	487200
29 Mar	169.3	236973	164.5	230253	0.0	0	333.7	467227
28 Mar	168.6	236063	162.6	227687	0.0	0	331.3	463750
27 Mar	173.5	242877	169.6	237393	0.0	0	343.1	480270
26 Mar	175.4	245583	167.6	234593	0.0	0	343.0	480177
25 Mar	185.4	259513	184.8	258697	0.0	0	370.2	518210
24 Mar	184.0	257600	181.5	254053	0.0	0	365.5	511653

23 Mar	193.3	270667	183.0	256247	0.0	0	376.4	526913
22 Mar	187.3	262150	183.3	256667	0.0	0	370.6	518817
21 Mar	170.8	239143	163.9	229507	0.0	0	334.8	468650
20 Mar	172.7	241733	163.2	228503	0.0	0	335.9	470237
19 Mar	174.5	244347	170.9	239190	0.0	0	345.4	483537
18 Mar	194.9	272813	185.9	260283	0.0	0	380.8	533097
17 Mar	193.3	270597	189.8	265743	0.0	0	383.1	536340
16 Mar	197.9	277060	193.0	270177	0.0	0	390.9	547237
15 Mar	204.9	286813	196.4	274890	0.0	0	401.2	561703
14 Mar	214.2	299903	195.2	273303	0.0	0	409.4	573207
13 Mar	157.7	220757	184.4	258160	0.0	0	342.1	478917
12 Mar	182.8	255920	180.1	252187	0.0	0	362.9	508107
11 Mar	197.7	276803	189.5	265277	0.0	0	387.2	542080
10 Mar	121.3	169867	568.0	795200	0.0	0	689.3	965067
09 Mar	213.7	299110	205.2	287233	0.0	0	418.8	586343
08 Mar	243.1	340387	232.0	324777	0.0	0	475.1	665163
07 Mar	190.7	267027	189.3	264973	0.0	0	380.0	532000
06 Mar	189.7	265580	184.8	258720	0.0	0	374.5	524300
05 Mar	195.2	273257	203.6	285063	0.0	0	398.8	558320
04 Mar	214.2	299927	205.0	286977	0.0	0	419.2	586903
03 Mar	166.9	233613	161.4	226007	0.0	0	328.3	459620
02 Mar	198.2	277433	191.1	267587	0.0	0	389.3	545020
01 Mar	148.3	207667	147.6	206640	0.0	0	295.9	414307
28 Feb	147.0	205753	144.9	202813	0.0	0	291.8	408567
27 Feb	150.0	209953	146.2	204680	0.0	0	296.2	414633
26 Feb	155.9	218260	152.4	213383	0.0	0	308.3	431643
25 Feb	174.6	244393	169.2	236903	0.0	0	343.8	481297
24 Feb	165.0	231023	158.4	221713	0.0	0	323.4	452737
23 Feb	156.1	218563	148.8	208367	0.0	0	305.0	426930
22 Feb	145.0	202953	140.7	196933	0.0	0	285.6	399887
21 Feb	149.5	209230	143.7	201133	0.0	0	293.1	410363
20 Feb	151.3	211867	147.4	206337	0.0	0	298.7	418203
19 Feb	159.5	223277	156.1	218517	0.0	0	315.6	441793
18 Feb	173.8	243273	169.1	236693	0.0	0	342.8	479967
17 Feb	172.2	241010	169.4	237137	0.0	0	341.5	478147
16 Feb	167.4	234360	162.0	226730	0.0	0	329.4	461090
15 Feb	156.7	219380	152.3	213220	0.0	0	309.0	432600

Jump to: Apple St. Pump Station Go

Daily Runtime Summary
Minutes and Gallons

Jump to: Apple St. Pump Station Go

Devices: Dicks Pond

Time	Pump 1		Pump 2		Multiple		Total	
	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons
14 Jun	128.1	83510	27.9	14815	780.0	0	156.0	98325
13 Jun	207.7	135442	113.7	60366	1440.0	0	321.4	195808
12 Jun	133.4	86955	173.4	92084	1440.0	0	306.8	179039
11 Jun	196.2	127944	125.5	66641	1440.0	0	321.7	194585
10 Jun	127.4	83054	212.4	112784	1440.0	0	339.8	195838
09 Jun	227.4	148265	115.9	61543	1440.0	0	343.3	209808
08 Jun	0.0	0	306.3	162645	1440.0	0	306.3	162645
07 Jun	95.3	62157	203.1	107828	1440.0	0	298.4	169986
06 Jun	195.6	127520	114.0	60525	1440.0	0	309.6	188045
05 Jun	126.7	82608	176.2	93553	1440.0	0	302.9	176162
04 Jun	211.7	138039	120.7	64092	1440.0	0	332.4	202131
03 Jun	142.7	93030	195.4	103749	1440.0	0	338.1	196778
02 Jun	227.3	148221	112.9	59923	1440.0	0	340.2	208145
01 Jun	131.7	85868	170.6	90580	1440.0	0	302.3	176448
31 May	195.7	127564	126.3	67048	1440.0	0	321.9	194611
30 May	144.1	93953	162.3	86190	1440.0	0	306.4	180143
29 May	201.8	131541	126.9	67393	1440.0	0	328.7	198934
28 May	143.8	93736	195.7	103917	1440.0	0	339.5	197653
27 May	223.8	145928	141.8	75278	1440.0	0	365.6	221207
26 May	0.0	0	340.8	180938	1440.0	0	340.8	180938
25 May	112.1	73089	213.4	113298	1440.0	0	325.5	186387
24 May	199.2	129878	121.3	64428	1440.0	0	320.5	194306
23 May	83.8	54627	231.9	123157	1440.0	0	315.7	177783
22 May	204.5	133312	97.5	51764	1440.0	0	302.0	185076
21 May	140.1	91356	175.0	92916	1440.0	0	315.1	184272
20 May	240.0	156480	120.9	64216	1440.0	0	360.9	220696
19 May	91.9	59897	231.1	122705	1440.0	0	323.0	182602
18 May	212.2	138344	117.8	62570	1440.0	0	330.0	200913
17 May	127.4	83054	191.5	101660	1440.0	0	318.8	184714
16 May	190.1	123934	123.8	65756	1440.0	0	313.9	189690
15 May	126.9	82739	196.5	104342	1440.0	0	323.4	187080
14 May	202.3	131921	116.9	62083	1440.0	0	319.3	194004
13 May	124.7	81315	213.0	113094	1440.0	0	337.7	194409
12 May	355.6	231840	0.0	0	1440.0	0	355.6	231840
11 May	222.5	145081	102.0	54162	1440.0	0	324.5	199243
10 May	189.5	123554	135.4	71906	1440.0	0	324.9	195460
09 May	191.3	124749	136.4	72446	1440.0	0	327.8	197195
08 May	130.9	85325	198.9	105589	1440.0	0	329.7	190914
07 May	201.4	131280	136.3	72366	1440.0	0	337.6	203647
06 May	122.7	80000	229.4	121794	1440.0	0	352.1	201794
05 May	244.6	159501	127.3	67614	1440.0	0	372.0	227115
04 May	125.8	82000	212.9	113068	1440.0	0	338.7	195067
03 May	232.2	151384	116.7	61977	1440.0	0	348.9	213360
02 May	145.2	94638	200.9	106696	1440.0	0	346.1	201333
01 May	206.2	134464	139.8	74252	1440.0	0	346.1	208716
30 Apr	152.6	99517	195.6	103855	1440.0	0	348.2	203372
29 Apr	266.9	173997	143.2	76039	1440.0	0	410.1	250036
28 Apr	104.4	68069	287.8	152822	1440.0	0	392.2	220891
27 Apr	292.4	190656	120.0	63729	1440.0	0	412.4	254385
26 Apr	176.3	114937	204.5	108572	1440.0	0	380.8	223509
25 Apr	361.9	235948	0.0	0	1440.0	0	361.9	235948
24 Apr	195.7	127586	119.3	63331	1440.0	0	315.0	190916
23 Apr	135.9	88596	183.8	97580	1440.0	0	319.7	186176
22 Apr	229.1	149362	130.3	69163	1440.0	0	359.3	218525
21 Apr	103.0	67123	228.1	121130	1440.0	0	331.1	188253
20 Apr	212.7	138648	125.2	66490	1440.0	0	337.9	205138
19 Apr	125.5	81804	184.5	97943	1440.0	0	309.9	179747
18 Apr	194.7	126955	129.2	68596	1440.0	0	323.9	195552
17 Apr	147.6	96246	185.0	98244	1440.0	0	332.6	194490
16 Apr	250.1	163033	94.7	50286	1440.0	0	344.8	213318
15 Apr	121.1	78925	178.7	94872	1440.0	0	299.7	173797
14 Apr	245.9	160294	99.7	52950	1440.0	0	345.6	213244
13 Apr	110.6	72133	251.6	133608	1423.3	0	362.3	205741
12 Apr	320.5	208955	29.6	15735	1410.4	0	350.1	224690
11 Apr	254.1	165641	79.5	42223	1440.0	0	333.6	207864
10 Apr	93.9	61190	206.7	109775	1440.0	0	300.6	170966
09 Apr	239.0	155817	97.1	51542	1440.0	0	336.1	207360
08 Apr	118.5	77262	235.9	125263	1440.0	0	354.4	202525
07 Apr	251.9	164250	126.6	67242	1440.0	0	378.6	231492
06 Apr	133.0	86705	225.4	119670	1440.0	0	358.4	206375
05 Apr	198.5	129444	150.7	80004	1440.0	0	349.2	209448
04 Apr	68.4	44586	283.0	150291	1440.0	0	351.4	194877
03 Apr	343.4	223919	0.0	0	1440.0	0	343.4	223919
02 Apr	342.6	223397	1.0	522	1440.0	0	343.6	223919
01 Apr	349.0	227570	0.0	0	1440.0	0	349.0	227570
31 Mar	394.3	257062	0.0	0	1440.0	0	394.3	257062
30 Mar	382.2	249162	0.0	0	1440.0	0	382.2	249162
29 Mar	360.3	234937	0.0	0	1440.0	0	360.3	234937
28 Mar	357.7	233231	0.0	0	1440.0	0	357.7	233231
27 Mar	368.4	240186	0.0	0	1440.0	0	368.4	240186
26 Mar	376.8	245674	0.0	0	1440.0	0	376.8	245674
25 Mar	400.1	260833	0.0	0	1440.0	0	400.1	260833
24 Mar	400.4	261072	0.0	0	1440.0	0	400.4	261072

23 Mar	412.3	268787	0.0	0	1440.0	0	412.3	268787
22 Mar	398.7	259974	0.0	0	1440.0	0	398.7	259974
21 Mar	360.9	235274	0.0	0	1440.0	0	360.9	235274
20 Mar	359.5	234394	2.0	1071	1440.0	0	361.5	235465
19 Mar	380.8	248260	0.0	0	1440.0	0	380.8	248260
18 Mar	411.4	268255	0.0	0	1440.0	0	411.4	268255
17 Mar	420.5	274133	0.0	0	1440.0	0	420.5	274133
16 Mar	442.9	288793	0.0	0	1440.0	0	442.9	288793
15 Mar	457.7	298410	0.0	0	1440.0	0	457.7	298410
14 Mar	466.5	304180	0.0	0	1440.0	0	466.5	304180
13 Mar	300.3	195796	0.0	0	1440.0	0	300.3	195796
12 Mar	381.8	248912	0.0	0	1440.0	0	381.8	248912
11 Mar	390.4	254541	0.0	0	1380.0	0	390.4	254541
10 Mar	248.1	161739	0.0	0	1440.0	0	248.1	161739
09 Mar	436.5	284620	0.0	0	1440.0	0	436.5	284620
08 Mar	474.6	309439	0.0	0	1440.0	0	474.6	309439
07 Mar	389.6	254019	0.0	0	1440.0	0	389.6	254019
06 Mar	366.7	239078	0.0	0	1440.0	0	366.7	239078
05 Mar	382.4	249336	0.0	0	1440.0	0	382.4	249336
04 Mar	401.4	261735	0.0	0	1440.0	0	401.4	261735
03 Mar	331.4	216073	0.0	0	1440.0	0	331.4	216073
02 Mar	402.4	262376	0.0	0	1440.0	0	402.4	262376
01 Mar	288.5	188080	0.0	0	1440.0	0	288.5	188080
28 Feb	274.6	179050	0.0	0	1440.0	0	274.6	179050
27 Feb	270.1	176094	0.0	0	1440.0	0	270.1	176094
26 Feb	291.6	190101	0.0	0	1440.0	0	291.6	190101
25 Feb	326.3	212726	0.0	0	1440.0	0	326.3	212726
24 Feb	310.4	202348	0.0	0	1440.0	0	310.4	202348
23 Feb	302.6	197306	0.0	0	1440.0	0	302.6	197306
22 Feb	276.9	180550	0.0	0	1440.0	0	276.9	180550
21 Feb	281.0	183223	0.0	0	1440.0	0	281.0	183223
20 Feb	286.2	186613	0.0	0	1440.0	0	286.2	186613
19 Feb	313.4	204348	0.0	0	1440.0	0	313.4	204348
18 Feb	330.4	215410	0.0	0	1440.0	0	330.4	215410
17 Feb	334.7	218214	0.0	0	1440.0	0	334.7	218214
16 Feb	320.1	208673	0.0	0	1440.0	0	320.1	208673
15 Feb	300.9	196198	0.0	0	1440.0	0	300.9	196198

Jump to: Apple St. Pump Station Go

Daily Runtime Detail
Minutes (Gallons)

Device
Hynes Field

Time	Pump 1		Pump 2		Total	
	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons
14 Jun	0	0	47	99,499	33	0	80	99,499
13 Jun	0	0	82	173,594	55	0	137	173,594
12 Jun	0	0	82	173,594	62	0	144	173,594
11 Jun	0	0	85	179,945	57	0	142	179,945
10 Jun	0	0	94	198,998	67	0	161	198,998
09 Jun	0	0	91	192,647	63	0	154	192,647
08 Jun	0	0	86	182,062	56	0	142	182,062
07 Jun	0	0	89	188,413	59	0	148	188,413
06 Jun	0	0	84	177,828	53	0	137	177,828
05 Jun	0	0	86	182,062	56	0	142	182,062
04 Jun	0	0	89	188,413	60	0	149	188,413
03 Jun	0	0	91	192,647	57	0	148	192,647
02 Jun	0	0	85	179,945	60	0	145	179,945
01 Jun	0	0	78	165,126	54	0	132	165,126
31 May	0	0	76	160,892	49	0	125	160,892
30 May	0	0	77	163,009	56	0	133	163,009
29 May	0	0	82	173,594	60	0	142	173,594
28 May	0	0	100	211,700	66	0	166	211,700
27 May	0	0	110	232,870	65	0	175	232,870
26 May	0	0	117	247,689	72	0	189	247,689
25 May	0	0	139	294,263	59	0	198	294,263
24 May	0	0	151	319,667	44	0	195	319,667
23 May	0	0	108	228,636	51	0	159	228,636
22 May	0	0	88	186,296	52	0	140	186,296
21 May	0	0	95	201,115	58	0	153	201,115
20 May	0	0	102	215,934	65	0	167	215,934
19 May	0	0	86	182,062	61	0	147	182,062
18 May	0	0	90	190,530	55	0	145	190,530
17 May	0	0	82	173,594	56	0	138	173,594
16 May	0	0	86	182,062	51	0	137	182,062
15 May	0	0	87	184,179	52	0	139	184,179
14 May	0	0	85	179,945	50	0	135	179,945
13 May	0	0	86	182,062	55	0	141	182,062
12 May	0	0	94	198,998	53	0	147	198,998
11 May	0	0	84	177,828	43	0	127	177,828
10 May	0	0	81	171,477	52	0	133	171,477
09 May	0	0	79	167,243	51	0	130	167,243
08 May	0	0	82	173,594	53	0	135	173,594
07 May	0	0	91	192,647	52	0	143	192,647
06 May	0	0	95	201,115	56	0	151	201,115
05 May	0	0	95	201,115	56	0	151	201,115
04 May	0	0	95	201,115	55	0	150	201,115
03 May	0	0	97	205,349	53	0	150	205,349
02 May	0	0	95	201,115	56	0	151	201,115
01 May	0	0	96	203,232	56	0	152	203,232
30 Apr	0	0	105	222,285	56	0	161	222,285
29 Apr	0	0	113	239,221	67	0	180	239,221
28 Apr	0	0	113	239,221	61	0	174	239,221
27 Apr	0	0	112	237,104	56	0	168	237,104
26 Apr	0	0	98	207,466	63	0	161	207,466
25 Apr	0	0	89	188,413	54	0	143	188,413
24 Apr	0	0	80	169,360	44	0	124	169,360
23 Apr	0	0	82	173,594	53	0	135	173,594
22 Apr	0	0	97	205,349	60	0	157	205,349
21 Apr	0	0	86	182,062	58	0	144	182,062
20 Apr	0	0	90	190,530	58	0	148	190,530
19 Apr	0	0	89	188,413	51	0	140	188,413
18 Apr	0	0	96	203,232	49	0	145	203,232
17 Apr	0	0	88	186,296	55	0	143	186,296
16 Apr	0	0	85	179,945	58	0	143	179,945
15 Apr	0	0	88	186,296	56	0	144	186,296
14 Apr	0	0	80	169,360	55	0	135	169,360
13 Apr	0	0	85	179,945	48	0	133	179,945
12 Apr	0	0	79	167,243	48	0	127	167,243
11 Apr	0	0	81	171,477	45	0	126	171,477
10 Apr	0	0	84	177,828	51	0	135	177,828
09 Apr	0	0	91	192,647	54	0	145	192,647
08 Apr	0	0	96	203,232	57	0	153	203,232
07 Apr	0	0	95	201,115	56	0	151	201,115
06 Apr	0	0	85	179,945	61	0	146	179,945
05 Apr	0	0	86	182,062	56	0	142	182,062
04 Apr	0	0	93	196,881	52	0	145	196,881
03 Apr	0	0	90	190,530	58	0	148	190,530
02 Apr	0	0	90	190,530	53	0	143	190,530
01 Apr	0	0	101	213,817	62	0	163	213,817
31 Mar	0	0	103	218,051	57	0	160	218,051
30 Mar	0	0	96	203,232	61	0	157	203,232
29 Mar	0	0	101	213,817	59	0	160	213,817
28 Mar	0	0	101	213,817	59	0	160	213,817
27 Mar	0	0	95	201,115	63	0	158	201,115
26 Mar	0	0	101	213,817	60	0	161	213,817
25 Mar	0	0	112	237,104	65	0	177	237,104
24 Mar	0	0	118	249,806	65	0	183	249,806
23 Mar	0	0	123	260,391	73	0	196	260,391
22 Mar	0	0	113	239,221	74	0	187	239,221
21 Mar	0	0	98	207,466	61	0	159	207,466
20 Mar	0	0	95	201,115	60	0	155	201,115
19 Mar	0	0	100	211,700	63	0	163	211,700
18 Mar	0	0	110	232,870	69	0	179	232,870
17 Mar	0	0	112	237,104	68	0	180	237,104

16 Mar	0	0	110	232,870	72	0	182	232,870
15 Mar	0	0	122	258,274	71	0	193	258,274
14 Mar	0	0	101	213,817	67	0	168	213,817
13 Mar	0	0	71	150,307	41	0	112	150,307
12 Mar	0	0	116	245,572	74	0	190	245,572
11 Mar	0	0	138	292,146	84	0	222	292,146
10 Mar	0	0	87	184,179	50	0	137	184,179
09 Mar	0	0	159	336,603	94	0	253	336,603
08 Mar	0	0	186	393,762	98	0	284	393,762
07 Mar	0	0	145	306,965	76	0	221	306,965
06 Mar	0	0	148	313,316	84	0	232	313,316
05 Mar	0	0	144	304,848	91	0	235	304,848
04 Mar	0	0	148	313,316	83	0	231	313,316
03 Mar	0	0	33	69,861	21	0	54	69,861
02 Mar	0	0	113	239,221	72	0	185	239,221
01 Mar	0	0	76	160,892	54	0	130	160,892
28 Feb	0	0	80	169,360	48	0	128	169,360
27 Feb	0	0	81	171,477	54	0	135	171,477
26 Feb	0	0	77	163,009	52	0	129	163,009
25 Feb	0	0	102	215,934	63	0	165	215,934
24 Feb	0	0	86	182,062	46	0	132	182,062
23 Feb	0	0	79	167,243	46	0	125	167,243
22 Feb	0	0	69	146,073	44	0	113	146,073
21 Feb	0	0	79	167,243	45	0	124	167,243
20 Feb	0	0	86	182,062	54	0	140	182,062
19 Feb	0	0	87	184,179	51	0	138	184,179
18 Feb	0	0	90	190,530	59	0	149	190,530
17 Feb	0	0	92	194,764	55	0	147	194,764
16 Feb	0	0	90	190,530	53	0	143	190,530
15 Feb	0	0	85	179,945	52	0	137	179,945
14 Feb	0	0	42	88,914	28	0	70	88,914

Daily Runtime Detail
Minutes (Gallons)

Device
Narrows

Time	Pump 1		Pump 2		Pump 3		Total	
	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons	Minutes	Gallons
14 Jun	77	111,496	63	106,974	77	108,339	217	326,809
13 Jun	135	195,480	127	215,646	160	225,120	422	636,246
12 Jun	146	211,408	131	222,438	157	220,899	434	654,745
11 Jun	139	201,272	124	210,552	155	218,085	418	629,909
10 Jun	142	205,616	110	186,780	151	212,457	403	604,853
09 Jun	150	217,200	131	222,438	148	208,236	429	647,874
08 Jun	146	211,408	132	224,136	155	218,085	433	653,629
07 Jun	150	217,200	130	220,740	151	212,457	431	650,397
06 Jun	155	224,440	137	232,626	157	220,899	449	677,965
05 Jun	157	227,336	139	236,022	159	223,713	455	687,071
04 Jun	151	218,648	147	249,606	158	222,306	456	690,560
03 Jun	157	227,336	128	217,344	156	219,492	441	664,172
02 Jun	148	214,304	136	230,928	161	226,527	445	671,759
01 Jun	153	221,544	136	230,928	167	234,969	456	687,441
31 May	150	217,200	131	222,438	167	234,969	448	674,607
30 May	153	221,544	134	227,532	158	222,306	445	671,382
29 May	163	236,024	144	244,512	168	236,376	475	716,912
28 May	170	246,160	143	242,814	183	257,481	496	746,455
27 May	168	243,264	146	247,908	173	243,411	487	734,583
26 May	160	231,680	143	242,814	179	251,853	482	726,347
25 May	152	220,096	148	251,304	172	242,004	472	713,404
24 May	157	227,336	140	237,720	168	236,376	465	701,432
23 May	164	237,472	139	236,022	182	256,074	485	729,568
22 May	165	238,920	151	256,398	175	246,225	491	741,543
21 May	161	233,128	145	246,210	178	250,446	484	729,784
20 May	164	237,472	155	263,190	188	264,516	507	765,178
19 May	162	234,576	145	246,210	177	249,039	484	729,825
18 May	157	227,336	145	246,210	176	247,632	478	721,178
17 May	159	230,232	155	263,190	184	258,888	498	752,310
16 May	183	264,984	141	239,418	185	260,295	509	764,697
15 May	336	486,528	142	241,116	615	865,305	1,093	1,592,949
14 May	223	322,904	178	302,244	219	308,133	620	933,281
13 May	187	270,776	156	264,888	177	249,039	520	784,703
12 May	190	275,120	164	278,472	177	249,039	531	802,631
11 May	200	289,600	169	286,962	184	258,888	553	835,450
10 May	206	298,288	163	276,774	191	268,737	560	843,799
09 May	201	291,048	166	281,868	196	275,772	563	848,688
08 May	216	312,768	173	293,754	199	279,993	588	886,515
07 May	241	348,968	170	288,660	217	305,319	628	942,947
06 May	229	331,592	243	412,614	206	289,842	678	1,034,048
05 May	253	366,344	174	295,452	207	291,249	634	953,045
04 May	246	356,208	183	310,734	228	320,796	657	987,738
03 May	281	406,888	195	331,110	248	348,936	724	1,086,934
02 May	280	405,440	188	319,224	248	348,936	716	1,073,600
01 May	325	470,600	183	310,734	272	382,704	780	1,164,038
30 Apr	309	447,432	187	317,526	265	372,855	761	1,137,813
29 Apr	324	469,152	209	354,882	275	386,925	808	1,210,959
28 Apr	301	435,848	194	329,412	260	365,820	755	1,131,080
27 Apr	277	401,096	182	309,036	238	334,866	697	1,044,998
26 Apr	251	363,448	183	310,734	226	317,982	660	992,164
25 Apr	247	357,656	162	275,076	212	298,284	621	931,016
24 Apr	227	328,696	160	271,680	195	274,365	582	874,741
23 Apr	235	340,280	163	276,774	198	278,586	596	895,640
22 Apr	236	341,728	167	283,566	204	287,028	607	912,322
21 Apr	243	351,864	158	268,284	204	287,028	605	907,176
20 Apr	239	346,072	171	290,358	215	302,505	625	938,935
19 Apr	256	370,688	167	283,566	217	305,319	640	959,573
18 Apr	253	366,344	175	297,150	215	302,505	643	965,999
17 Apr	255	369,240	179	303,942	214	301,098	648	974,280
16 Apr	245	354,760	169	286,962	218	306,726	632	948,448
15 Apr	235	340,280	167	283,566	202	284,214	604	908,060
14 Apr	237	343,176	175	297,150	209	294,063	621	934,389
13 Apr	169	244,712	124	210,552	159	223,713	452	678,977
12 Apr	78	112,944	64	108,672	78	109,746	220	331,362
11 Apr	237	343,176	177	300,546	215	302,505	629	946,227
10 Apr	189	273,672	151	256,398	187	263,109	527	793,179
09 Apr	233	337,384	181	307,338	218	306,726	632	951,448
08 Apr	222	321,456	169	286,962	208	292,656	599	901,074
07 Apr	130	188,240	107	181,686	121	170,247	358	540,173
06 Apr	237	343,176	177	300,546	230	323,610	644	967,332
05 Apr	253	366,344	194	329,412	234	329,238	681	1,024,994
04 Apr	252	364,896	192	326,016	247	347,529	691	1,038,441
03 Apr	243	351,864	190	322,620	230	323,610	663	998,094
02 Apr	249	360,552	192	326,016	244	343,308	685	1,029,876
01 Apr	262	379,376	187	317,526	247	347,529	696	1,044,431
31 Mar	262	379,376	190	322,620	257	361,599	709	1,063,595
30 Mar	277	401,096	203	344,694	268	377,076	748	1,122,866
29 Mar	275	398,200	197	334,506	284	399,588	756	1,132,294
28 Mar	297	430,056	207	351,486	300	422,100	804	1,203,642
27 Mar	300	434,400	202	342,996	302	424,914	804	1,202,310
26 Mar	323	467,704	208	353,184	326	458,682	857	1,279,570
25 Mar	330	477,840	201	341,298	325	457,275	856	1,276,413
24 Mar	335	485,080	213	361,674	331	465,717	879	1,312,471
23 Mar	340	492,320	210	356,580	341	479,787	891	1,328,687
22 Mar	344	498,112	199	337,902	327	460,089	870	1,296,103
21 Mar	305	441,640	196	332,808	295	415,065	796	1,189,513
20 Mar	296	428,608	196	332,808	287	403,809	779	1,165,225
19 Mar	296	428,608	201	341,298	287	403,809	784	1,173,715
18 Mar	308	445,984	213	361,674	288	405,216	809	1,212,874
17 Mar	299	432,952	222	376,956	286	402,402	807	1,212,310

16 Mar	294	425,712	229	388,842	278	391,146	801	1,205,700
15 Mar	305	441,640	231	392,238	298	419,286	834	1,253,164
14 Mar	293	424,264	220	373,560	272	382,704	785	1,180,528
13 Mar	241	348,968	183	310,734	254	357,378	678	1,017,080
12 Mar	308	445,984	227	385,446	287	403,809	822	1,235,239
11 Mar	313	453,224	221	375,258	284	399,588	818	1,228,070
10 Mar	215	311,320	156	264,888	203	285,621	574	861,829
09 Mar	375	543,000	245	416,010	334	469,938	954	1,428,948
08 Mar	396	573,408	246	417,708	360	506,520	1,002	1,497,636
07 Mar	330	477,840	224	380,352	298	419,286	852	1,277,478
06 Mar	343	496,664	196	332,808	313	440,391	852	1,269,863
05 Mar	362	524,176	230	390,540	339	476,973	931	1,391,689
04 Mar	258	373,584	461	782,778	374	526,218	1,093	1,682,580
03 Mar	283	409,784	188	319,224	282	396,774	753	1,125,782
02 Mar	258	373,584	312	529,776	304	427,728	874	1,331,088
01 Mar	254	367,792	182	309,036	249	350,343	685	1,027,171
28 Feb	230	333,040	182	309,036	225	316,575	637	958,651
27 Feb	232	335,936	184	312,432	216	303,912	632	952,280
26 Feb	225	325,800	167	283,566	207	291,249	599	900,615
25 Feb	237	343,176	192	326,016	220	309,540	649	978,732
24 Feb	230	333,040	172	292,056	208	292,656	610	917,752
23 Feb	225	325,800	185	314,130	212	298,284	622	938,214
22 Feb	191	276,568	147	249,606	179	251,853	517	778,027
21 Feb	235	340,280	191	324,318	221	310,947	647	975,545
20 Feb	244	353,312	191	324,318	230	323,610	665	1,001,240
19 Feb	246	356,208	197	334,506	225	316,575	668	1,007,289
18 Feb	228	330,144	227	385,446	222	312,354	677	1,027,944
17 Feb	216	312,768	191	324,318	217	305,319	624	942,405
16 Feb	224	324,352	193	327,714	217	305,319	634	957,385
15 Feb	228	330,144	188	319,224	214	301,098	630	950,466
14 Feb	123	178,104	101	171,498	124	174,468	348	524,070

Attachment E: Pump Station Pump Rates

PUMP STATION CONDITION ASSESSMENT

Pump Station: Dicus Pond
Address: CR Ave Berry Hwy
Inspection Date: 8-13-13
Inspected By: R Miller

GENERAL INFORMATION

Year Facility Constructed: 1989
Year Facility Modified:
Facility Description: Concrete Block
Asphalt Roof Shingles Cedar Siding

PUMP STATION EQUIPMENT

Number of Pumps: 2
Service Area: Y

Pump #1: S/N K3T1-059964		Motor #1:	
Year Installed:	1989	Year Installed:	1989
Manufacturer:	Fairbanks Morse	Manufacturer:	Marathon Elec
Model and No.:	5" 85414	Model and No.:	S/N K3T1-059964
Type:	Non Clog Centrifugal	Type:	
NOM efficiency:		Horsepower:	40
Design capacity/TDH:		Efficiency:	
Pump RPM:		Inverter duty:	
Valve size and type:	8" Check Valves	Variable/Constant:	VFD Driven
Observed flow:		Vertical/Horizontal:	Vert
Observed TDH:		Motor RPM:	1200
		Pump curve available:	

Comments: Valves MH V+F Co Anniston AlA Pumps should be painted
Pump #1 rebuilt 2012 impeller wear rings etc.

Pump #2:	SAME ↑	Motor #2:	SAME ↑
Year Installed:		Year Installed:	
Manufacturer:		Manufacturer:	
Model and No.:		Model and No.:	
Type:		Type:	
NOM efficiency:		Horsepower:	
Design capacity/TDH:		Efficiency:	
Pump RPM:		Inverter duty:	
Valve size and type:		Variable/Constant:	
Observed flow:		Vertical/Horizontal:	
Observed TDH:		Motor RPM:	
		Pump curve available:	

Comments: Pump #2 Rebuilt 7/2003 Bearings, Seals, impeller etc.

Yakasawa VFD's Installed 2004 - Good

Pump #3:
Year Installed:
Manufacturer:
Model and No.:
Type:
NOM efficiency:
Design capacity/TDH:
Pump RPM:
Valve size and type:
Observed flow:
Observed TDH:

N/A

Motor #3:
Year Installed:
Manufacturer:
Model and No.:
Type:
Horsepower:
Efficiency:
Inverter duty:
Variable/Constant:
Vertical/Horizontal:
Motor RPM:
Pump curve available:

Comments:

Pump #4:
Year Installed:
Manufacturer:
Model and No.:
Type:
NOM efficiency:
Design capacity/TDH:
Pump RPM:
Valve size and type:
Observed flow:
Observed TDH:

N/A

Motor #4:
Year Installed:
Manufacturer:
Model and No.:
Type:
Horsepower:
Efficiency:
Inverter duty:
Variable/Constant:
Vertical/Horizontal:
Motor RPM:
Pump curve available

Comments:

General Station Comments: Emergency LTS should be replaced - 3000
1200F should be replaced. Trim Boards paint + replace
As necessary
VFDs -
generator 50000 -
Roof 5000
Trim
wood shingles 7000 -
80000
100000

Previous Pump Tests: Hewlett - 3000

OTHER PIPING AND VALVES

Paint All Piping 8" + 10" Valves

Air relief valves: N/A — Excellent Good Fair Poor

Isolation valves: — Excellent ~~Good~~ Fair (Poor)

Piping: — Excellent (Good) Fair Poor

Comments:
PAint Isolation Valves in Wet well Frozen

ELECTRICAL SYSTEMS INSPECTION

Location Classification:
- Dry Location [✓]
- Wet or Damp Location [ ]
- Wet Corrosive Location [ ]

Comments:

Standby Generator:
- Mnfr: Ford/Leroy Somer
- Model: LSG 8751 / LSA 42-44
- Year Installed: 1989
- Rating:
- Fuel Type: N/G

Excellent (Good) Fair Poor

Facility Load:

Ample capacity (Y/N):

Interior Lighting Type: Flourescent — Excellent (Good) Fair Poor

Lighting Level: — Excellent Good Fair Poor

Exterior Lighting Type: Sodium — Excellent Good Fair Poor

Panel Boards: — Excellent (Good) Fair Poor

Motor Control Center: — Excellent (Good) Fair Poor

Disconnect Switches: — Excellent (Good) Fair Poor

Lightning Protection: — Excellent Good Fair Poor

Fire Alarm System: — Excellent (Good) Fair Poor

Security System: N/A — Excellent Good Fair Poor

Potential Code Issues:

Comments: Generator AKA Superior mod # 75 R461

PAINT in Cond. Elec BOX · outside

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Honeywell — Excellent (Good) Fair Poor

Pressure Gauges: — Excellent Good (Fair) Poor

Other: — Excellent Good Fair Poor

SCADA: N/A Mission — Excellent (Good) Fair Poor

Comments: 3 Yr Plan Replace Bubbler tube system w/ Mercoid

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/G — Fuel Storage Capacity: UTILITY

Heating Type: Forced Hot Air N/G — Excellent Good Fair (Poor)

Ventilation Type: — Excellent Good Fair Poor

AC System Type: N/A — Excellent Good Fair Poor

Dehumidification: 2 units N/G — Excellent Good Fair (Poor)

Louvers: — Excellent Good Fair Poor

Comments: New carbon for wet well ventilation
MORE work to be done by Mechanical contractor

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. Replace E. Lighting	$ 2000.00
2. Repair W.W. Vent	$
3.	$
4.	$
5.	$
TOTAL	$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. Replace Asphalt Roof	$ 4000.00
2.	$
3.	$
4.	$
5.	$
TOTAL	$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation

1.
2.
3.
4.
5.

Peak Flow Capacity Estimator:

Site:	Design Capacity (Gal/Day):	Start Date:	End Date:	
Dicks Pond	Gallons per day	3/14/2018	6/14/2018	Analyze

Pump Model/Capacity(GPM)			
☑ Fairbanks Morse 85414 5" 652	☑ Fairbanks Morse 85414 5" 531	☐ Pump3 0	☐ Pump4 0
☐ Pump5 0	☐ Pump6 0	☐ Pump7 0	☐ Pump8 0

PUMP STATION CONDITION ASSESSMENT

25 yrs Electrical Panel!

Pump Station:	Depot St	Inspection Date:	8-13-13
Address:	Depot St E. Wareham MA	Inspected By:	B. [illegible]

GENERAL INFORMATION

Year Facility Constructed:	1989	Year Facility Modified:	
Facility Description:	Concrete Block Structure w/ Asphalt roof Cedar siding, wetwell, +3 level Dry Side Pump + Elec		

PUMP STATION EQUIPMENT

Number of Pumps:	2	Service Area:	Y

Pump #1:		Motor #1:	
Year Installed:	1989	Year Installed:	1989
Manufacturer:	Fairbanks Morse	Manufacturer:	MARATHON E/E
Model and No.:	B 5414	Model and No.:	405TTFS 7394AN
Type:	Centrifugal	Type:	TFS
NOM efficiency:		Horsepower:	75
Design capacity/TDH:		Efficiency:	92.4
Pump RPM:	1200	Inverter duty:	
Valve size and type:	10" CHECK MHV + F CO	Variable/Constant:	VFD
Observed flow:		Vertical/Horizontal:	Vert
Observed TDH:		Motor RPM:	1200
		Pump curve available:	

Comments: Wear Rings, + Drive line replaced / rebuilt 2002
Pump Bearings Replaced 2002 + 2005 Due to poor seal installation.
MOTOR GOOD COND, NO Problems

Pump #2:	SAME ↑	Motor #2:	SAME ↑
Year Installed:		Year Installed:	
Manufacturer:		Manufacturer:	
Model and No.:		Model and No.:	
Type:		Type:	
NOM efficiency:		Horsepower:	
Design capacity/TDH:		Efficiency:	
Pump RPM:		Inverter duty:	
Valve size and type:		Variable/Constant:	
Observed flow:		Vertical/Horizontal:	
Observed TDH:		Motor RPM:	
		Pump curve available:	

Comments:
Wear rings, Drive line, and pump Bearings replaced / rebuilt 2002.
MOTOR GOOD CONDITION

w/ mechanical seals on Both pumps - NO WATER is getting to bearings. They should LAST Longer than the original Bearings which LASTED ± 13 years, Pumps could be due to bearing, wearing replacement ± 2017-2018

Pump #3:
Year Installed: ____
Manufacturer: ____
Model and No.: ____
Type: ____
NOM efficiency: ____
Design capacity/TDH: ____
Pump RPM: ____
Valve size and type: ____
Observed flow: ____
Observed TDH: ____

Motor #3:
Year Installed: ____
Manufacturer: ____
Model and No.: ____
Type: ____
Horsepower: ____
Efficiency: ____
Inverter duty: ____
Variable/Constant: ____
Vertical/Horizontal: ____
Motor RPM: ____
Pump curve available: ____

Comments: ____

Pump #4:
Year Installed: ____
Manufacturer: ____
Model and No.: ____
Type: ____
NOM efficiency: ____
Design capacity/TDH: ____
Pump RPM: ____
Valve size and type: ____
Observed flow: ____
Observed TDH: ____

Motor #4:
Year Installed: ____
Manufacturer: ____
Model and No.: ____
Type: ____
Horsepower: ____
Efficiency: ____
Inverter duty: ____
Variable/Constant: ____
Vertical/Horizontal: ____
Motor RPM: ____
Pump curve available ____

Comments: ____

General Station Comments: Roof is 23 years old probably Due for replacement.
Paint inside + out walls, trim, piping, pumps etc.
Paint Exterior Elec Box.
emergency lighting
Heaters
Generator 85,000
10,000
electric panel?
ventilation 80,000
81,500

Previous Pump Tests: ____

OTHER PIPING AND VALVES

Air relief valves: N/A — Excellent Good Fair Poor

Isolation valves: Frozen up — Excellent Good Fair (Poor)

Piping: SHOULD Paint All 10" +12" — Excellent (Good) Fair Poor

Comments:

ELECTRICAL SYSTEMS INSPECTION

Location Classification: Dry Location [x] — Comments:
Wet or Damp Location [ ]
Wet Corrosive Location [ ]

Standby Generator: Mnfr: Superior — Excellent (Good) Fair Poor
Model: 140 R 461
Year Installed: 1989
Rating:
Fuel Type: N/C
Facility Load:
Ample capacity (Y/N):

Interior Lighting Type: Flourescent — Excellent (Good) Fair Poor

Lighting Level: — Excellent (Good) Fair Poor

Exterior Lighting Type: Sodium Halose — Excellent (Good) Fair Poor

Panel Boards: — Excellent (Good) Fair Poor

Motor Control Center: — Excellent (Good) Fair Poor

Disconnect Switches: — Excellent (Good) Fair Poor

Lightning Protection: — Excellent Good Fair Poor

Fire Alarm System: — Excellent (Good) Fair Poor

Security System: N/A — Excellent Good Fair Poor

Potential Code Issues:

Comments: Emergency Lighting needs Replacing

OTHER:

INSTRUMENTATION AND CONTROLS

Flow Meters/Transmitters: Honeywell Inline — Excellent Good **(Fair)** Poor

Pressure Gauges: — Excellent Good **(Fair)** Poor

Other: — Excellent Good Fair Poor

SCADA: Mission — Excellent **(Good)** Fair Poor

Comments:
Shoud consider upgrade to Mercoid like Colonset + remove bubbler system

MECHANICAL SYSTEMS INSPECTION

Fuel Source: N/G — Fuel Storage Capacity: Utility

Heating Type: Forced Hot Air N/Good — Excellent Good Fair **(Poor)**

Ventilation Type: Fans + Duct work — Excellent Good Fair Poor

AC System Type: N/A — Excellent Good Fair Poor

Dehumidification: Not working — Excellent Good Fair **(Poor)**

Louvers: — Excellent Good Fair Poor

Comments:
(Carbon) Need to Bid for Repair of Ventilation system
New ~~Charcoal~~ for Wetwell Vents

RECOMMENDATIONS

CATEGORY A ITEMS (Immediate Action)

Item/Recommendation	Estimated Capital Project Cost
1. Replace E. Lighting	$ 2000.00
2. Repair Wetwell Ventilation	$
3.	$
4.	$
5.	$
TOTAL	$

CATEGORY B ITEMS (Implement within 5 years)

Item/Recommendation	Estimated Capital Project Cost
1. Asphalt Roof	$ 4000.00
2.	$
3.	$
4.	$
5.	$
TOTAL	$

CATEGORY C ITEMS (Implement between 6 and 10 years)

Item/Recommendation
1.
2.
3.
4.
5.

Peak Flow Capacity Estimator:

Site:	Design Capacity (Gal/Day):	Start Date:	End Date:	
Depot St	Gallons per day	3/14/2018	6/14/2018	Analyze

Pump Model/Capacity(GPM)			
☑ Fairbanks Morse 85414 6" gpm @ 60hz 1400	☑ Fairbanks Morse 85414 6" 1400	☐ Pump3 0	☐ Pump4 0
☐ Pump5 0	☐ Pump6 0	☐ Pump7 0	☐ Pump8 0

Attachment F: TR-16 Guidance Document, Chapter 2

CHAPTER 2

SANITARY SEWERS/ WASTEWATER COLLECTION SYSTEMS

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REVISED IN 2016

2.1 Design of Sanitary Sewers

This chapter provides guidance on the design and construction of sanitary sewers. Sanitary sewers include all gravity flow components of a wastewater collection system.

2.2 Design Capacity and Design Flow

2.2.1 Design Factors

In determining the required design parameters of sanitary sewers, the following factors must be considered:

- Peak hourly wastewater flow
- Additional peak flows of industrial and commercial wastes
- Maximum groundwater infiltration
- Topography of immediate area
- Difficulty of installation

2.2.2 Design Period

In general, wastewater collection systems should be designed for a life span of 50 years, and interceptor sewers should be designed to handle the maximum 50-year build-out tributary population. Communities should plan ahead for repair or replacement after 50 years of use. Consider the maximum capacity of uses such as institutions and industrial parks.

2.2.3 Design Flow

Submit to reviewing agency a detailed description of procedures used for sewer design.

2.2.3.1 Flow Related to Water Consumption

When available, use existing wastewater flow and/or water consumption data as a basis for sewer design. If such data are not available, consider using flow data from a similar

community or estimating flows based on the per capita usage described below or on the total number of bedrooms and square footage of non-residential uses served.

2.2.3.2 Per Capita Flow

Where actual flow data cannot be obtained, residential flows from new collection systems should be based on an average daily per capita flow of not less than 70 gallons per day (0.27 m^3/day).

2.2.3.3 Infiltration

Add an appropriate allowance to the capacity of sanitary sewers for infiltration due to normal aging of piping systems. An allowance of 250–500 gpd/in. diameter/mile of sewer (0.24–0.48 m^3/cm of pipe diam/km/day) is suggested as a normal range of infiltration. Amounts in excess of this estimate may be allowed if supporting documentation is provided. Evaluate soil and groundwater conditions in determining projected infiltration rates.

2.2.4 Peak Design Flow

Generally, sanitary sewers should be designed on a peak hourly design flow basis. The peak hourly flow rate is defined as the largest volume of flow to be received during a one-hour period and expressed as volume per unit time.

Wastewater flow consists of four components: domestic, commercial, industrial, and institutional. Where existing data are unavailable, peak domestic design flow may be determined using the ratio of peak to average daily flow as described in Figure 2-1 (from the Water Environment Federation/ American Society of Civil Engineers Manual of Practice (WEF/ASCE) publication, *MOP-FD-5 Gravity Sanitary Sewer Design and Construction*). Commercial, institutional, and industrial flows will generally have a different, lower peaking factor, depending on locations in a system and hours of operation.

When designing sewers, increased wet weather flow due to infiltration and inflow (I/I) must be considered. Refer to guidance included in 1.2.1.h *Infiltration/Inflow*. The area to be served should submit evidence that excessive I/I does not exist. If a reduction of I/I is proposed, a careful evaluation of the anticipated flow reduction should be made. Flow increases due to the elimination of sewer bypasses and backups should also be evaluated.

2.3 Details of Sewer Design and Construction

2.3.1 Minimum Size

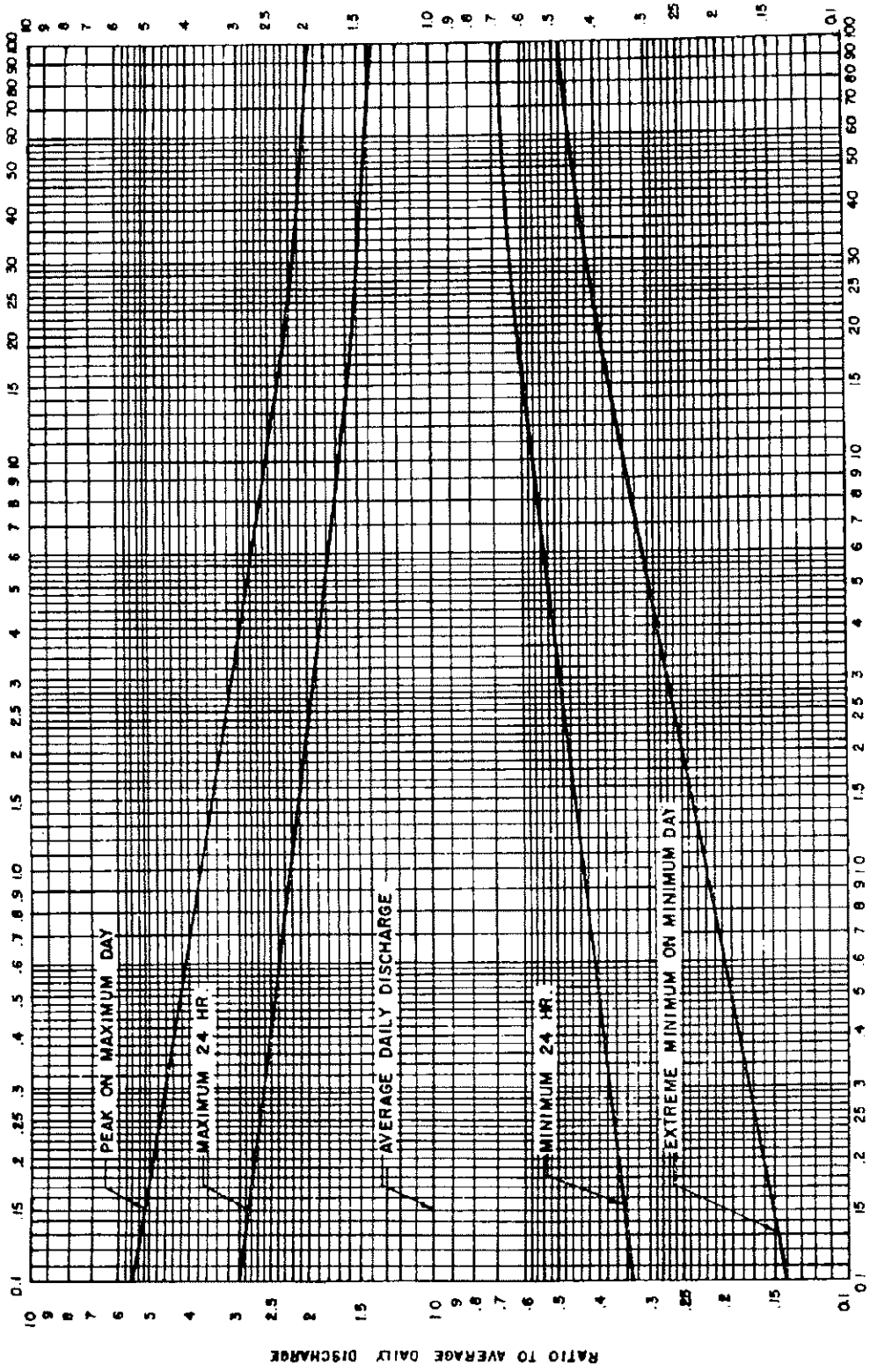
No public gravity sewer should be less than 8 inches in diameter (200 mm).

2.3.2 Depth

In general, sewers should be deep enough to drain basement fixtures and to prevent freezing. Provide insulation for sewers that cannot be placed deep enough to prevent freezing.

For house connections, chimneys (vertical pipe) should be considered when the sewer main is greater than or equal to 12 feet deep or the drop between the house connection and the main is greater than or equal to 3 feet. This should be considered only if the chimney is economical and meets minimum cover requirements for pipe protection. The design of chimneys should consider the vertical loads that will be exerted on the sewer main and fittings; an effective design transfers such loads from the pipe to the adjoining bedding and ground to prevent over-insertion, fracture, or misalignment.

Figure 2-1 **Ratio of Extreme Flow to Average Daily Flow**



2.3.3 Buoyancy

Where high groundwater conditions are anticipated, the buoyancy of sewers should be considered. The floatation of pipe should be prevented with appropriate construction.

2.3.4 Fats, Oils and Grease

In locations where fats, oils, and grease (FOG) problems are anticipated, such as downstream of restaurants or at wastewater pumping stations, grease traps or other devices should be included in the plumbing and/or sewer design to address the problems. Grease trap designs must often conform with local design standards and requirements, such as building and plumbing codes and sewer use ordinances.

2.3.5 Slope

2.3.5.1 Recommended Minimum Slopes

All sewers should be designed and constructed to give a velocity (when flowing full) of not less than 2.0 feet per second (0.61 m/s) based on Manning's formula using an "n" value of 0.013. (A reviewing agency may permit the use of other "n" values if deemed justified on the basis of research or field data.) The following minimum slopes may be used only if absolutely necessary because of grade restrictions; greater slopes are desirable.

Sewer Size	Minimum Slope in Feet per Foot (m/m)
8 inches (200 mm)	0.004
10 inches (250 mm)	0.0028
12 inches (300 mm)	0.0022
14 inches (350 mm)	0.0017
15 inches (375 mm)	0.0015
16 inches (400 mm)	0.0014
18 inches (450 mm)	0.0012
21 inches (525 mm)	0.0010
24 inches (600 mm)	0.0008
27 inches (675 mm)	0.00067
30 inches (750 mm)	0.00058
36 inches (900 mm)	0.00046
42 inches (1050 mm)	0.00037
48 inches (1200 mm)	0.00031

2.3.5.2 Minimize Solids Deposition

Select the pipe diameter and slope for the greatest practical velocities to minimize settling problems. The use of oversized sewers to justify flatter slopes is discouraged. If a proposed slope is less than the minimum slope required for the smallest pipe in a system, the design engineer should calculate the actual depths and velocities at minimum, average, and maximum day and peak hourly flow for each section of the sewer and submit this information to the reviewing authority.

2.3.5.3 Slope Between Manholes

Sewers should be laid out with a uniform slope between manholes.

2.3.5.4 High Velocity Protection

Design sewer pipes at a slope so the resulting velocities are no greater than 10 feet per second (3.0 m/s) to minimize scouring of the pipe invert. If velocities are expected to exceed this limit in a steep section of pipe, the engineer should consider the use of appropriately designed sewer manhole drop structures. In circumstances where velocities exceed 10 ft/s by necessity, special attention should be given to other hydraulic parameters, including hydraulic jumps and minor losses (manholes, bends, etc.) and the anchoring of pipes by concrete collars, etc., on the steep stretch of sewer. The calculated velocity should be derived using the actual anticipated peak hourly flow and hydraulic elements related to the depth of flow.

2.3.5.5 Steep Slope Protection

Securely anchor sewers on 15 percent slopes, or greater, to prevent displacement.

2.3.5.6 Impervious Dams

Impervious dams should be considered every 300 feet to control the flow of groundwater within pipe bedding material when:

- The surrounding native material is considerably less pervious than the pipe bedding material.
- The pipe bedding could produce a hydraulic head of 25 feet on pipe gaskets and joints during periods of high groundwater flow.
- Sewers are constructed downstream of waterway and wetland crossings.

2.3.6 Alignment

In general, sewers 30 inches (750 mm) or less in diameter should be laid out in a straight line, and alignment should be checked with a laser beam. Curvilinear alignment of sewers larger than 30 inches (750 mm) may be considered on a case-by-case basis, provided the pipe manufacturer's maximum allowable pipe joint deflection limits are not exceeded.

2.3.7 Changes in Pipe Size

When a smaller sewer joins a sewer of a larger diameter, lower the invert of the larger sewer enough to maintain the same energy gradient. One way to do this is to place the 0.8 depth point of both sewers at the same elevation. When the diameter ratio of the smaller sewer to the larger sewer is equal to or greater than 0.8, it is permissible to match crowns.

2.3.8 Materials

Sewer pipe materials include vitrified clay, cast iron, and asbestos concrete, which are typically found in older systems, but should not be used in the design of new systems. Reinforced concrete, pre-stressed concrete, ductile iron, and polyvinyl chloride are typically found in newer systems. Other materials, such as high density polyethylene or polypropylene, may also be considered. Material considerations include pipe strength, stiffness, corrosion resistance, and ease of installation. Materials for sewer construction should be appropriate for local conditions, including the character of industrial wastes, septicity, soil characteristics, external loadings, and problems such as abrasion and corrosion.

All sewers should be capable of withstanding damage from superimposed loads. Make proper allowances for soil and potential groundwater conditions, as well as trench width and depth. Where necessary, special bedding, haunching and initial backfill, concrete cradles, or other special construction elements should be used.

Appropriatcly sized couplings that comply with ASTM standards should be used when joining dissimilar pipe materials.

2.3.9 Installation

2.3.9.1 Standards

Specifications for installation should include appropriate requirements based on criteria and standards established by the industry. Requirements for pipe and methods of back-filling should not cause damage to a pipe or its joints, impede cleaning operations and future tapping, create excessive sidefill pressures and deflection of the pipe, or seriously impair flow capacity.

2.3.9.2 Trenching

The trench should be wide enough to allow for pipe to be laid out and jointed properly, and for the bedding and haunching to be placed and compacted adequately to support the pipe. When wider trenches are specified, appropriate bedding class and pipe strength should be used.

To determine the minimum trench width needed in unsupported, unstable soil, consider the size and stiffness of the pipe, the stiffness of the embedment and in situ soil, and depth of cover.

Ledge rock, boulders, and large stones should be removed, providing a minimum of 4 inches (102 mm) below and on each side of all pipe(s).

All water entering excavations should be removed until completion of the work. No sanitary sewer should be used for disposal of trench water, unless specifically approved by both the engineer and the reviewing agencies on a case-by-case basis.

2.3.9.3 Bedding, Haunching, and Initial Backfill

Bedding classes A, B, and C, or crushed stone as described in the American Society of Testing Materials standard ASTM C12, should be used for all rigid pipe. Such bedding supports the anticipated load based on the type of soil and the potential groundwater conditions.

Materials for bedding, haunching, and initial backfill, or classes I, II, or III as described in ASTM D2321, should be used for all flexible pipe. Such bedding supports the anticipated load based on the type of soil and the potential groundwater conditions.

2.3.9.4 Final Backfill

Final backfill should be of a suitable material removed from the excavation except where other material is specified. Do not use debris, frozen material, large clods or stones, organic matter, or other unsuitable materials for final backfill within 2 feet (610 mm) of the top of a pipe.

2.3.9.5 Trenchless Technologies

Below are descriptions of some of the more commonly used trenchless technology techniques.

2.3.9.5.1 Jack and Bore and Pipe Jacking

The jack and bore method is a process of simultaneously jacking sections of casing pipe through the earth while removing the spoils inside the casing by

means of a rotating flight auger. A boring machine applies both thrust to the casing pipe and torque to the rotating auger. The auger rotates inside the casing as it is being jacked. Since augers can damage any interior liners or coatings, the standard casing material used with auger boring is steel pipe. Casing diameters up to 60 inches can be installed by this method. Installation lengths of several hundred feet are feasible.

Pipe jacking is a similar method in that casing sections are pushed into the earth with a boring machine. However, hand excavation rather than augers is used to remove spoils from the interior of the casing. As human entry is required, the minimum pipe diameter used in this method is normally 36 inches. Diameters of over 60 inches can be installed, with installation lengths similar to the jack and bore method. Casing materials can be steel, reinforced concrete, or fiberglass.

Both methods can be used to install casing pipe in a variety of ground conditions. However, where cobbles and boulders or rock are encountered, the jack and bore method becomes impractical due to the need to remove augers whenever an obstruction is encountered. Neither method is commonly used for stream crossings or very wet soils where the probability of cave-ins is high.

Both methods require construction of a jacking pit on one side of the obstacle to be crossed. The pit should be approximately 15–20 feet wide and 35–40 feet long. Where right-of-way is limited, pit dimensions may require construction equipment to work on both sides of the obstacle, or temporary easements may have to be obtained.

Jacking is a feasible method for highway and railroad crossings, or for other projects where an open cut installation is not desired or allowed.

2.3.9.5.2 Microtunneling

Microtunneling is an extension of the pipe jacking technique. A remotely controlled microtunnel boring machine (MTBM) is coupled to a jacking pipe at the back of the machine. The MTBM is driven from a drive shaft to a receiving shaft by means of hydraulic jacks, with lengths of pipe added as the machine is driven forward. Soil excavated by the boring machine is carried to the ground surface through a slurry pipe. The term "micro" is a misnomer because the technique can be used to install pipe from twelve inches to twelve feet in diameter. The maximum length of installation, or drive, can be in the range of 1,500–2,000 feet.

Microtunneling is a very effective installation technique when soil geology is variable across the length of drive. An MTBM can employ a variety of cutting heads—blades for soft soil, picks for hard soil/soft rock, and disc cutters for hard rock. The MTBM is capable of balancing the slurry pressure against the soil pressure at the face of the machine. Because MTBMs are capable of pressure balancing, microtunneling is suitable for installations under waterways, in rock, and in mixed soil media. This technique is also useful when extremely accurate line and grade installations are required.

A drive shaft is required on one side of the obstacle to be crossed. The shaft will have dimensions similar to that of a pipe jacking shaft, and may be constructed in a circular manner.

The pipe installed by microtunneling can be used as a casing pipe or as a carrier pipe. Human entry into the tunnel is not required; hence, the minimum diameter can be less than 36 inches. Types of pipe that can be installed by microtunneling include steel, prestressed concrete cylinder, and fiberglass. Recent pilot tests indicate that ductile iron pipe with modified joints may also be installed by microtunneling.

On a cost per foot basis, microtunneling is more expensive than open cut, pipe jacking, or horizontal directional drilling. Microtunneling becomes cost-effective when soil conditions are difficult or mixed media, when deep open cut excavations would be required, or when the required installation length exceeds that capable of being installed by pipe jacking.

2.3.9.5.3 Horizontal Directional Drilling

Horizontal directional drilling (HDD) is a trenchless construction method that can be used to install pipelines where surface disturbances are discouraged, prohibited, or more costly. HDD allows a pipeline to be installed under an obstacle, working entirely from the ground surface, and with control over horizontal and vertical alignments. Typically, HDD is used to cross physical features such as water bodies, highways, and environmentally sensitive areas. Basic elements of a horizontal directional drill installation include:

- Installation of a pilot bore hole using a drill rig along a designed and guided drill profile.
- Enlargement of the pilot hole by pushing and pulling successively larger reaming tools through the hole.
- Preparing the product pipeline along the ground surface.
- Pulling the product pipeline back through the drill hole.

High density polyethylene (HDPE) and steel are the most commonly used materials for the product pipeline. For smaller diameter (24 inches and smaller) and shorter length crossings (1,500 feet and less), HDPE has the advantage of being lighter to pull, corrosion resistant, and capable of being installed to a tighter bending radius. Steel is commonly used for larger diameter and longer crossings, or where internal and external loadings exceed the capacity of HDPE. Installation lengths of more than 5,000 feet have been successfully completed using HDD.

The most desirable soil conditions to drill through are clays and sands. HDD crossings can be constructed through rock, but the drilling process is slower. Because of their unpredictable nature and location, the most difficult soils to drill through are cobbles and boulders. Such rocky geology in an area does not rule out the use of HDD; however, soil borings must be performed should this method be considered for a specific crossing or section of alignment.

The HDD method does permit pipelines to be installed along both a horizontal and vertical curvature.

2.3.10 Testing

2.3.10.1 Deflection

Deflection tests should be performed on all flexible pipes. The tests should be conducted

after the final backfill has been in place for at least 30 days. The delay allows for permit stabilization of the pipe system.

Appropriate pipe deflection standards from ASTM should be reviewed as well as considerations from the manufacturer of a particular pipe. Typically, however, no pipe should exceed a deflection of 5 percent. If deflection exceeds 5 percent, the pipe should be replaced.

The rigid ball or mandrel used for a deflection test should have a diameter of not less than 95 percent of the base inside diameter or the average inside diameter of the pipe as specified by ASTM. The pipe should comply with ASTM D2122 Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings. The tests should be performed without mechanical pulling devices. Other testing devices such as electronic deflectometers or calibrated video cameras may be considered.

2.3.10.2 Leakage Tests

The specifications should include a requirement for leakage tests, including appropriate water or low-pressure air testing. The testing method should cover the range in groundwater elevations during the test and during the design life of the sewer.

Water (Hydrostatic) Test: The leakage (exfiltration or infiltration) should not exceed 100 gallons per inch of pipe diameter per mile per day (0.019 m^3/cm of pipe diam./km/day) for any section of the pipe system. Perform an exfiltration or infiltration test with a minimum positive head of 2 feet (610 mm).

Air Test: Air testing, if used, should conform to test procedures described in ASTM C828-86 for clay pipe or ASTM C924 for concrete pipe, or those procedures approved by the regulatory agency.

2.3.10.3 Alignment Tests

Perform a lamp test for the correctness of horizontal and vertical alignment on each length of pipe between manholes. This test should be completed after all upstream work has been completed and after a final backfill has been in place at least 30 days. Water should be introduced to the pipe tested. Standing water should not be observed during the test.

2.3.10.4 Television Inspection Tests

Television inspection may be appropriate for some pipe installations. When used, television inspection must conform to standards of the National Association of Sewer Service Companies (NASCCO) Pipeline Assessment Certification Program (PACP), and Lateral Assessment Certification Program (LACP).

2.4 Manholes

2.4.1 Location

Manholes should be installed at the end of each line; at all changes in grade, size, or alignment; and at all pipe intersections. Distances between manholes should not be greater than 400 feet (120 m) for sewers measuring 15 inches (375 mm) or less in diameter, or 500 ft (15 m) for sewers 18–30 inches (450 to 750 mm) in diameter. Distances up to 600 ft (183 m) may be approved in cases where adequate modern cleaning equipment is provided. Greater distances may be permitted for larger sewers or for those carrying a settled effluent, but only with prior approval of the reviewing agency.

2.4.2 Drop Type

Provide a drop pipe for a sewer pipe with an invert entering a manhole more than 24 inches (61 cm) above the manhole invert. Where the difference in elevation between the incoming sewer and manhole invert is less than 24 inches (61 cm), the invert should be filleted to prevent solids deposition.

Encase outside drop connections in concrete. When necessary, secure inside drop connections to the interior wall of the manhole to provide access for cleaning.

2.4.3 Diameter

The minimum diameter should be 48 inches (122 cm) for standard manholes and 60 inches (153 cm) for inside drop manholes. Structure openings and manhole frame and cover dimensions should be coordinated as appropriate for ease of access and to suit applicable regulations and/or requirements of the state in which the work is to be performed. Larger openings should be provided for manholes that house equipment.

2.4.4 Materials

Manholes should be precast concrete with barrel sections, cones, and bases manufactured in compliance with ASTM C478, and should have gasketed joints. Manholes can also be poured-in-place concrete. Other types of manholes are also allowed, subject to approval of the reviewing agency. In some locales, it may be prudent to install locking manhole covers or some other means to eliminate access to the collection system. This may be necessary in more remote locations or in areas with security requirements. Consider these concerns early in the design of a system.

2.4.5 Flow Channel

The flow channel through manholes should conform in shape and slope to that of the sewers entering and leaving the manholes. Construct the top of the flow channel so the flow will remain in the channel under peak conditions. Form or shape the channel walls to the full height of the crown of the outlet sewer and so as not to obstruct maintenance, inspection, or flow in the sewers. When curved flow channels are required, including branch inlets, increase minimum slopes to maintain acceptable velocities. Provide a minimum 0.1-foot drop through the manhole.

2.4.6 Bench

Provide a bench on each side of every manhole channel. The bench should have a slope of no less than 0.5 inch (13 mm) per foot (305 mm) and no greater than 1.0 inch per foot. No lateral sewer, service connection, or drop manhole pipe should discharge onto the surface of the bench.

2.4.7 Buoyancy

Where high groundwater conditions are anticipated, consider buoyancy of manholes, and prevent floatation with appropriate construction.

2.4.8 Watertightness

Solid or watertight manhole covers should be used in areas subject to flooding. Manhole lift holes and grade adjustment rings should be sealed with a non-shrinking mortar or other material approved by the reviewing agency. A bituminous coating may also be used on the exterior. Inlet and outlet pipes should be joined to the manhole with a gasketed, flexible watertight connection or with another watertight connection arrangement that allows for differential settlement of the pipe and manhole.

2.4.9 Inspection and Testing

The specifications should include a requirement for the inspection and testing of manholes for leaks or damage. Leakage tests may include appropriate water or vacuum testing.

Water (Hydrostatic) Testing: The leakage exfiltration rate should not exceed 1 gallon per vertical foot of manhole section for a 24-hour period. A period of time may be permitted, before beginning the test, to allow for absorption of water into the concrete manhole.

Vacuum Testing: Conduct vacuum tests on a sealed manhole at an initial test pressure of 10 inches of mercury. The vacuum drop should not exceed 1 inch of mercury over the period of time as follows:

0 to 10-foot deep manholes	–	2 minutes
10- to 15-foot deep manholes	–	2.5 minutes
> 15-foot deep manholes	–	3 minutes

2.4.10 Corrosion Protection

Corrosion protection for interior surfaces of manholes or other structures should be considered if high concentrations of hydrogen sulfide or other corrosive constituents are anticipated in wastewater flows originating from long force mains or other sources. Additional guidance can be found in this report in Chapter 10: Odor and VOC Control as well as the Water Environment Federation's Manual of Practice No. 25, *Control of Odors & Emissions from Wastewater Treatment Plants.*

2.5 Inverted Siphons (Depressed Sewers)

Inverted siphons are depressed sewers designed to flow full and under pressure. They generally are used to avoid obstacles, such as utilities, railways, subways, and streams. Depressed sewers should have no less than two barrels with a minimum pipe size of 6 inches (150 mm), and should be provided with manholes at both ends for convenient flushing and maintenance. Manholes should be vented and have adequate clearances for cleaning equipment and for inspection and flushing. The design should provide for sufficient heads and pipe sizes to secure velocities of at least 3.0 feet per second (0.92 m/s) for average flows under initial conditions to keep the pipe(s) clear of settleable solids. Inlet and outlet details should be arranged so normal flow is diverted to one barrel and so that either barrel may be taken out of service for maintenance. Consider providing a hose connection to the siphon for flushing purposes.

2.6 Aerial Crossings

Provide appropriate support for all joints and pipes used for aerial crossing. The supports should withstand frost heaves as well as overturning, settlement, flooding, thermal expansion, vibrations, and other loads that may act against the piping. Take measures to prevent freezing (e.g., insulation, heat traces, or increased slope). Provide expansion joints between above-ground and below-ground sewers. Where buried sewers change to aerial sewers, evaluate special construction techniques, such as the required length of casing pipe embedment into the adjoining soil embankment and placement of supports, to minimize damage from frost heaves. For aerial stream crossings, consider the impact of flood waters and debris. The bottom of a pipe should be no lower than the 50-year flood elevation level. Ductile iron pipe with restrained mechanical joints is recommended.

2.7 Protection of Water Resources

2.7.1 Location of Sewers in Streams

2.7.1.1 Cover Depth

The top of all sewers entering or crossing streams should be sufficiently below the natural bottom of the streambed to protect the sewer line. In general, the following cover requirements must be met:

- 1 foot (305 mm) of cover where the sewer is located in rock.
- 3 feet (914 mm) of cover in other material. In major streams, more than 3 feet (914 mm) of cover may be required.
- In paved stream channels, place the top of the sewer line at least 1 foot (305 mm) below the channel pavement.

2.7.1.2 Horizontal Location

Position sewers located along streams sufficiently outside of the streambed to allow for stream widening in the future and for the prevention of siltation during construction. Consideration should be given to armoring the stream channel in the vicinity of the sewer to prevent channel erosion and to avoid the possibility of exposing the sewer.

2.7.1.3 Structures

Locate sewer manholes or other structures outside of streams whenever possible. Where structures must be located in a stream, they should not interfere with the free discharge of flood flows.

2.7.1.4 Alignment

Sewers should cross streams perpendicular to the flow without a change in grade. Design sewer systems to minimize the number of stream crossings.

2.7.2 Construction

2.7.2.1 Materials

Sewers entering or crossing streams should be watertight and free from changes in alignment or grade. Joints should be restrained to prevent movement from stream forces. In major streams, provide ball-and-socket or restrained joints designed for hard service applications. For smaller streams, provide mechanical joints with retainer glands.

Backfill materials should be stone, coarse aggregate, washed gravel, or other materials that will not readily erode, cause siltation, damage pipe during backfill, or corrode the pipe. In large stream crossings, place riprap over the sewer pipe to prevent erosion.

2.7.2.2 Siltation and Erosion

Use construction methods that will minimize siltation and erosion. The design engineer should include in the project specifications the construction methods to be used for sewers in or near streams. Such methods should control siltation and erosion by limiting unnecessary excavation, including disturbing or uprooting of trees and vegetation, dumping of soil or debris, or pumping silt-laden water into a stream. Specifications should require cleanup, grading, planting, and restoration of all work areas to begin immediately after construction is complete.

2.8 Protection of Water Supplies

2.8.1 Cross Connections

No physical connection should exist between a public or private potable water supply system and a sewer or any appurtenance that would permit the passage of wastewater or polluted water into the potable supply. No water pipe should pass through or come into contact with any part of a sewer manhole.

2.8.2 Relation to Water Works Structures

Sewers should be located far away from public water supply wells or other potable water supply sources and structures (check with state or local wellhead protection policies). Engineering plans should show all existing waterworks units, such as basins, wells, or other treatment units that are within 200 feet of the proposed sewer or within the minimum distance required by the reviewing agency.

2.8.3 Relation to Water Mains

2.8.3.1 Horizontal Separation

When possible, lay out sewers at least 10 feet (3.0 m) from any existing or proposed water main. If local conditions prevent a lateral separation of 10 feet, the reviewing agency may make an exception on a case-by-case basis when supported by data from the design engineer. Such an exception may allow the sewer to be installed closer than 10 feet to a water main, provided the sewer is laid out in a separate trench with the top (crown) of the sewer at least 18 inches (46 cm) below the bottom (invert) of the water main.

2.8.3.2 Vertical Separation

Whenever sewers must cross water mains, lay out the sewer so the top of the sewer is at least 18 inches (46 cm) below the bottom of the water main. The sewer joints should be equidistant and located as far away as possible from the water main joints. When the sewer cannot meet the above requirements, relocate the water main to provide for this separation or reconstruct it with mechanical-joint pipe for a distance of 10 feet (3.0 m) on each side of the sewer. One full-length water main should be centered over the sewer so that both joints will be as far from the sewer as possible.

Where a water main crosses under a sewer, adequate structural support should be provided for the sewer to maintain line and grade.

Note: When it is impossible to achieve horizontal and/or vertical separation as stipulated above, both the water main and sewer should be constructed of mechanical-joint cement-lined ductile iron pipe or another equivalent that is watertight and structurally sound. Both pipes should be tested to ensure that they are watertight. Alternatively, pipe sleeves and/or concrete encasement should be considered.

2.8.3.3 Water Reuse Lines

Typically, potable water lines should have the same horizontal and vertical separation from reuse lines as from sewer lines. If there are potable, reuse, and sewer lines in the same street, protection priority goes to potable water, then reuse and finally sewer lines.

2.9 Alternative Collection Systems

Alternative collection systems can reduce construction costs, including pipe and excavation costs. Alternative systems also allow for easier construction in cases of high groundwater levels or ledges. However, these systems generally are more complicated than conventional gravity systems, and they can have significantly higher operating and maintenance costs.

In general, there are two main categories of alternative collection systems: vacuum sewer systems and pressure sewer systems. Each requires different pressures to transport wastewater flow, as well as different pipe materials.

2.9.1 Vacuum Sewer Systems

A vacuum sewer system is essentially a pressure system, in that differential air pressure is used to create flow. Vacuum systems are often proposed as collection systems for flat land surfaces and for cases where high groundwater levels and construction difficulties exist. There have been instances in colder climates where condensation in a valve pit has caused ice crystals to form on controllers and thereby prevented the valves from properly opening and closing. Valve pits should be insulated in cold climates.

2.9.1.1 Piping Design

Vacuum sewers should handle the peak flow from dwellings. Size the pipe using the Hazen-Williams formula for full-bore flow. A C-factor of 150 for PVC should be used. Within a system, the flow consists of 2 parts of air to 1 part of liquid. For vacuum sewer pipelines, use the equivalent of Class 200, SDR 21 PVC piping or greater to provide the necessary working pressure rating for the system, and to provide durability during installation. Piping should be deep enough to prevent freezing, and should be installed in a saw tooth pattern.

2.9.1.2 Collection Station Design

Nomenclature

N_v = Number of valves connected to collection station

Q_{max} = Station peak flow, gpm (L/s)

Q_a = Station average flow, gpm (L/s)

Q_{min} = Station minimum flow, gpm (L/s) = Q_a/z

Q_{dp} = Discharge pump capacity, cfm (L/s)

Q_{vp} = Vacuum pump capacity, cfm (L/s)

Q_{vpe} = Effective vacuum pump capacity, cfm (L/s)= $Q_{vp} - k_1 N_v$

k_1 = 0.15 cfm (0.07 L/s)

V_o = Operating volume of collection tank, gallons (L)

V_{ct} = Collection tank volume, gallons (L)

V_{rt} = Reserve tank volume, gallons (L)

t = Cycle time of discharge pumps, minutes (s)

z = Ratio of average station flow to minimum flow

2.9.1.3 Vacuum Pumps

The following minimum vacuum pump sizes (Q_{vp}) are recommended:

For sewers up to 3,000 feet (914 m) long:

$$Q_{vp} = \frac{5\ Q_{max}}{k_2} + k_1 N_v$$

For sewers over 3,000 feet (914 m) long:

$$Q_{vp} = \frac{6\ Q_{max}}{k_2} + k_1 N_v$$

Where $k_2 = 7.5$ gal/ft^3 (1 L/s)

These formulas are provided for guidance only. Other factors to consider include type of vacuum pump, vacuum pump efficiency, temperature of sewage, type and temperature of service liquid (if applicable), and altitude at which a vacuum pump is to operate.

2.9.1.4 Discharge Pumps

Each sewage discharge pump capacity is 20 percent greater than the design peak flow:

$$Q_{dp} = 1.2\ Q_{max}$$

Motors are sized using the procedure for force mains. However, 25 feet (7.6 m) of additional head is required to pump against the vacuum in a collection tank.

2.9.1.5 Collection Tank

The operating volume of a collection tank is the sewage accumulation required to restart the discharge pump. Operating volume should be sized so that at minimum design flow, the pump will operate once every 15 minutes, as represented by the following equation:

$$V_o = 15 \left(\frac{Q_{min}}{Q_{dp}}\right)(Q_{dp} - Q_{min})$$

Total volume of the collection tank is 3.0 times the operating volume with a minimum size of 400 gallons (1,500 L). After fixing the operating volume, the designer should check to ensure an excessive number of pump starts per hour will not occur.

2.9.1.6 Standby Power

Provide standby power for use during emergency conditions. One hundred percent standby power is required.

2.9.1.7 Length of Collection Lines

Lengths of collection lines are governed by two main factors: static lift and losses. Total available head loss is 13 feet (4.0 m). Therefore, the sum total of static lifts and friction lost must not exceed this figure.

2.9.2 Pressure Sewer Systems

Wastewater can be conveyed to a pressure sewer using various approaches, such as septic tank effluent pumping (STEP) or grinder pumps. A pressure main is common to both systems. Pressure sewer systems contain other components such as isolation valves, anti-vacuum valves, air release valves, and cleanouts.

2.9.2.1 Pressure Sewer Main

Layout: The branched configuration of a pressure sewer is similar to that of a conventional gravity sewer system. Looped piping is not recommended and should not be permitted. Pipe routing should include long radius sweeps no less than those recommended by the pipe manufacturer. Pressure pipes should be deep enough to prevent freezing.

Pipe Size: Size the diameter of a pressure sewer so it provides a cleansing velocity based on the system's average daily flow. Consideration should also be given to system retention times to provide sufficient fluid changes to reduce the potential for odor generation. Guidance for pipe sizing is provided in WEF's Manual of Practice *FD-12 Alternative Sewer Systems.*

Pipe Material: Use the equivalent of Class 200, SDR 21 PVC piping or greater or HDPE SDR 11 in pressure sewers to provide the necessary working pressure rating for the system, and to provide durability during installation.

2.9.2.2 Isolation Valves and Check Valves

To allow isolation of individual STEP or grinder units, consider isolation valves at points where system expansion is projected and at key locations such as property lines.

A valve box with a redundant check valve should be provided at property lines to protect properties from flooding. (This does not apply to properties connected to a gravity sewer system.)

2.9.2.3 Air and Vacuum Valves

To release air trapped in pressure lines or to prevent system siphoning or vacuum conditions, include site air and vacuum valves at appropriate locations. Air release/vacuum valves should be located in a manhole or structure to allow access for repair and maintenance. Consider automatic air release valves to reduce a system's operations and maintenance costs.

Also, place air release manholes at high points in a system and at least 14 pipe diameters downstream of locations where hydraulic jumps occur. Hydraulic jumps form in sections where a pipeline intersects with a hydraulic grade line. Air bubbles formed by hydraulic jump conditions are carried downstream with wastewater flow.

2.9.2.4 Cleanout Connections

Provide a means for cleaning out pressure mains at sags and other locations where debris can accumulate and clog lines. Provide proper valving to conduct required maintenance at terminal ends of branches or zones, intersections, sharp bends, and low and high points; cleanout valves should be installed at least every 1,500–2,000 feet in all lines, even those without bends or elevation change.

2.9.3 Grinder Pump Systems

Pumping equipment must include an integral grinder capable of handling a reasonable quantity of foreign objects that may find their way into a building's sewerage system, since such systems are usually installed without septic tanks. The grinder pump must be capable of processing foreign objects without jamming, stalling, or overloading, and without making undue noise. The grinder should provide a positive flow of solids into the grinding zone. Grinder pump stations should be of the wetwell type.

The following items should be considered in the design of grinder pump systems.

2.9.3.1 Design of Pump Station

Access: Construct the service access for outside installation of the same material, and at least as thick as the tank. The access should have an opening at the surface with a minimum inside diameter of 24 inches (61 cm); its cover should be securely lockable. The size of the manhole must allow for the performance of maintenance and repair functions.

Tank: Construct each tank of concrete, high density polyethylene, or custom-molded, fiberglass-reinforced polyester resin using a filament wound process, layup and spray technique, or other approved process that will ensure a smooth and resin-rich interior surface designed for twice the maximum loading.

The tank should be furnished with one PVC closet flange or one flexible inlet flange suitable for connection to the household gravity line. At a minimum, the tank wall and bottom should be able to withstand twice the anticipated maximum pressure exerted on the tank, either from soil loadings or buoyancy forces. All station components must function normally when exposed to these loadings. Tanks should be sized to prevent accumulation of solids and designed to permit mixing during pumping actions.

Electrical Equipment: Wiring and electrical connections should be NEMA-rated for the environment in which they are to be placed.

All seals and joints should pass factory tests to ensure they are watertight. Proper service disconnects and circuit protection devices to permit lock-out and tag-out safety protocols should be provided. Motor protection devices such as high amperage and automatic thermal overload protection should also be provided.

2.9.3.2 Pumps

Pump Removal: The grinder pump should be readily removable without the need for manual disconnection of piping.

Grinder: The grinder should be positioned immediately below the pumping elements, securely fastened to the pump motor shaft, and driven directly by the same motor. The grinder should be a rotating type with a stationary hardened and ground stainless steel shredding ring that carries stainless steel cutter bars. This assembly should be dynamically balanced, and capable of operating without objectionable noises or vibrations over the entire range of recommended operating pressures.

Pump Opening: The grinder should be capable of reducing all components in normal domestic sewage, including a reasonable number of foreign objects (e.g., paper, wood, plastic, glass, and rubber). Objects should be reduced to finely divided particles that will pass through the passages of the pump and a minimum 1.25 inch (32 mm) diameter discharging pipe.

Intake: The grinder should be positioned so solids are fed into it from the bottom in an upward flow, reducing the possibility of overloading or jamming. Sufficient turbulence should be created to keep the tank bottom free of permanent deposits or sludge banks.

2.9.3.3 Check Valve and Anti-Siphon Valve

Equip the grinder pump with a check valve that is installed in a horizontal position on the discharge pipe. This valve should provide a full-ported passageway when open.

Equip the grinder pump with a gravity-operated, integral anti-siphon valve with corrosion-resistant moving parts and an opening no less than 60 percent of the inside diameter of the pump discharge piping.

2.9.3.4 Ventilation

Provide adequate ventilation in accordance with local and national codes.

2.9.3.5 Controls and Alarms

Use non-fouling sensing devices to detect wastewater levels for initiating pump operation and to detect high water levels. Level sensing devices are recommended. (Mercury float type switches should be avoided and are banned in some regions.) Sensing devices should not be located near flows entering the well. Alarm indicators should include an audible alarm (with a "silence" feature) and a visual light.

2.9.4 Septic Tank Effluent Pump (STEP) Systems

2.9.4.1 Septic Tanks

Septic tanks should be made of durable material and hold a minimum of 1,000 gallons. Tanks should provide a detention time of 24 hours based on the average daily design flow of the source. Septic tanks should meet all other local and state requirements.

2.9.4.2 Pumping Facilities

Centrifugal pumps or semi-positive displacement pumps may be used to pump effluent from a properly designed septic tank into a collection system. The facilities used to lift the wastewater flow should meet the criteria presented above for grinder pump systems, except that a grinder type pump is not required. STEP pump units should be capable of handling 1.25 inch diameter solids. A minimum of two pumps is recommended per installation, with the pumps sequenced to operate with a lead pump on and a lag pump on when needed. A third, standby pump is desirable when feasible; pumps should alternate as lead, lag, and standby.

2.10 Sewer System Investigation and Rehabilitation Techniques

2.10.1 General

This section is intended to provide a general description of sewer system evaluation and rehabilitation techniques. For more specific requirements and procedures, see the reference materials available from the National Association of Sewer Service Companies (NASSCO; www.nassco.org) or access the WEF/ASCE Manual of Practice FD-6 *Existing Sewer Evaluation and Rehabilitation*. Guidelines for conducting sewer investigation and rehabilitation programs may also be available from the state in which the work is performed.

Selection of a rehabilitation method should be based on a detailed analysis of existing system conditions, including identification of the need for rehabilitation, assessment of the outcomes of component failure, evaluation of the physical installation, assessment of expected performance attributes and requirements of potential rehabilitation technologies, and analysis of costs. Use any one or a combination of several analysis techniques to determine the need for rehabilitation of pipe systems.

2.10.2 Flow Analysis

Perform flow analysis to determine whether an existing or rehabilitated conduit will have sufficient capacity to accommodate required flows. Flow monitoring should provide quantitative data that establish existing average and peak flows as well as the existence and magnitude of infiltration, inflow, or exfiltration. Existing flow analysis and future flow forecasts should also be performed to determine the required hydraulic capacity of the pipeline. If insufficient capacity exists,

and would not be sufficiently increased by the beneficial hydraulic impacts of potential rehabilitation methods, explore alternative improvements.

2.10.3 Sewer Pipe Analysis

The principal method used to evaluate the physical condition of existing sewer pipe is inspection by closed-circuit television (CCTV) systems. CCTV inspection should be performed using full-color, digital, high-resolution video equipment with accurate distance measurement. Display distance measurements by attaching a direct reading distance meter to the coaxial camera cable. The meter should have an accuracy of 0.1 feet over the length of the sewer.

A CCTV inspection is performed by manually pulling or using a remote control to direct a television camera through a sewer line in either direction at a speed no greater than 30 feet per minute, stopping as necessary to ensure proper documentation of the sewer's condition. Flow should be minimized or suspended altogether to provide the most comprehensive observations possible. For short reaches in smaller pipelines, it may be possible to briefly stop flow using sewer plugs without causing pipeline surcharging. On larger pipelines with diameters of 60 inches or greater, it may be possible to perform the inspection by using hand-held video recording equipment.

Keep a record of the inspection on a digital video disc (DVD), labeled with headings noting location, direction, date, and firm performing the work. Written logs and digital still photographs should supplement the video, estimating rates of infiltration and describing the internal condition of the pipeline.

CCTV inspection must conform to standards of the NASSCO Pipeline Assessment Certification Program (PACP), Manhole Assessment Certification Program (MACP), and Lateral Assessment Certification Program (LACP). CCTV operators must have a valid certification of completion from a NASSCO PACP course, and be listed in the national database.

2.10.4 Cleaning

Prior to internal observation, it is necessary to clean the host pipeline so a complete scope of existing conditions can be viewed and a suitable substrate prepared for performing rehabilitation procedures.

Cleaning requirements and the amount of effort involved may vary depending on pipe age, slope, service, and physical integrity.

During cleaning, analyze liquids and solids removed from pipelines to determine hazardous components. Disposal of such hazardous components must be done by appropriate methods.

2.10.5 Temporary Flow Management

Existing or potential pipeline flows must be managed during internal inspection, cleaning, and rehabilitation activities. A flow management plan must be prepared to ensure the work program is not adversely affected. Flow management requirements may vary greatly depending on the type of system being evaluated or rehabilitated—i.e., separate sanitary or storm drainage systems, combined systems, or process waste pipelines.

A number of different flow management methods may be used to satisfy work program needs. These methods include:

- Flow division through parallel or other available piping systems
- Stoppage of flows for the duration of a procedure when sufficient storage exists in upstream facilities
- Bypassing flows around a work site

In all instances, consider all flow sources, as well as their magnitude, frequency, and timing when selecting an appropriate flow management method. Contingency plans must be developed to identify backup procedures for coping effectively with extreme or adverse conditions.

2.10.6 Safety

Pipeline rehabilitation typically involves personnel entering confined spaces, many of which have potentially hazardous atmospheres. Therefore, contract documents should require implementation of safety plans by all contractors and subcontractors involved. These safety plans should address procedures for confined space entry, including permitting and all other appropriate regulatory requirements established by OSHA and other applicable federal, state, and local programs.

2.10.7 Service Connections

Prior to rehabilitation, both active and inactive service connections should be identified using dye testing and other complementary procedures. After rehabilitation active services should be restored and inactive services may be sealed, if desired.

2.10.8 Pipeline Rehabilitation

Selection of a pipeline rehabilitation technique depends on several factors, including condition of the host pipe, hydraulic capacity before and after rehabilitation, and number of service laterals. Basic trenchless pipeline rehabilitation methods include sliplining, cured-in-place products, segmental pipe lining, spiral wound pipe lining, close-fit pipe lining, and pipe bursting. Tunneling options and pipe removal (microtunneling) may also be considered. Where applicable, rehabilitation may involve simple repairs and maintenance such as grouting and sealing, or point repairs.

2.10.9 Manhole Rehabilitation

Rehabilitation of sewer manholes may be required because of excessive leakage or structural concerns. Repairs may include using pressure pointing or chemical grouting to fix critical spots, or renovating the entire structure by monolithic surfacing techniques or by installing a new manhole.

2.11 Safety

Make adequate provisions to protect workers involved with construction and maintenance. In general, the design and construction of sewers and sewer rehabilitation work should meet all prescribed local, state, and national safety laws and codes. WEF's Manual of Practice No. 1, *Safety in Wastewater Works*, covers safety in detail.

References – Chapter 2

EPA Manual Alternative Wastewater Collection Systems, Oct. 1991, EPA/625/1-91/024

EPA Project Summary Alternative Sewer Studies, May 1986, EPA/600/S2-85/133

EPA Project Summary Investigations of Existing Pressure Sewer Systems, June 1985, EPA/600/S2-85/051

EPA Sewer System Infrastructure Analysis and Rehabilitation, Oct. 1991, EPA/625/6-91/030

Health Education Services Department, *Recommended Standards for Wastewater Facilities*, 2004 Edition

Uni-Bell PVC Pipe Association, Handbook of PVC Pipe, Design and Construction, Fourth Edition, 2001

WEF/ASCE Manual of Practice No. FD-5, *Gravity Sanitary Sewer Design and Construction*, 2007

WEF/ASCE Manual of Practice No. FD-6, *Existing Sewer Evaluation and Rehabilitation*, 2009

WEF Manual of Practice No. 1, *Safety in Wastewater Works*, 1994

WEF Manual of Practice No. 25, *Control of Odors & Emissions from Wastewater Treatment Plants*, 2004

WPCF Manual of Practice No. FD-12, *Facilities Development, Alternative Sewer Systems*, 2008

McMahon Response: The full access driveway on Red Brook Road allows for eastbound trips on Route 6 to access the proposed site via a left turn at the proposed Red Brook Road traffic signal and a left turn into the site from Red Brook Road. Left turns are prohibited at the Route 6 proposed site driveway due to the future median to be installed by MassDOT. Based on the capacity analysis conducted, significant queueing is not expected to result from the proposed northbound left turn movement into the site. Additionally, a SimTraffic micro-simulation was conducted to further review the traffic impacts of this movement. Based on this analysis, the 95th percentile queue for the northbound shared left/through movement on Red Brook Road was shown to be 70 feet during the weekday afternoon peak hour, which does not extend back to the Route 6 intersection located 200 feet away. Conversely, queuing from Red Brook Road vehicles in the southbound direction at the traffic signal are not expected to block the proposed driveway on Red Brook Road.

Based on our capacity analysis, there is no evidence showing the need to restrict left turns on the minor road of Red Brook Road. Entering left turns at the proposed Red Brook Road site driveway should have a minimal impact on the traffic flow and operations on Red Brook Road. Furthermore, turns restrictions are already imposed on the Route 6 site driveway. Restricting the Red Brook Road driveway to right turns only would negatively impact the project and traffic operations as all of the project Route 6 westbound trips (approximately 50 vehicles in the PM peak hour)would have to make a U-Turn at the intersection at the Red Brook Road traffic signal to access to the site, which would be expected to further degrade operations of this westbound signalized left turn/U-turn movement.

Comment 7: Sight Distance - *The sight distances reported in Table 3 of the TIS are measured in accordance with the American Association of State Highway and Transportation Officials (AASHTO) requirements. Although TEC concurs with the sight distances measured in excess of AASHTO minimum recommendations, the site plans should be revised to show any sight lines along the property frontage along Red Brook Road and Cranberry Highway. The sight line clear areas should be compared against the proposed Planting Plan to confirm that the sight lines will remain clear as reported in the traffic study. The Applicant's engineer should confirm that the fence or other vegetation on the abutting residential property will not impede the sight lines.*

McMahon Response: As noted, the sight distances reported in Table 3 of the TIS are measured in accordance with the American Association of State Highway and Transportation Officials (AASHTO) requirements. Plantings will be designed and maintained to not restrict lines of sight at the proposed site driveways. Sight lines have also been compared to the Planting Plan (dated January 12, 2018) and are not in conflict with any proposed landscaping features. In addition, the abutting residential fence will not impede sight lines on Red Brook Road as it is short in height (approximately three feet). Also, the fence appears to encroach within the public right-of-way for a distance of approximately four feet and the encroachment should be removed.

If you should have any further questions or require further information, please feel free to contact us.

Very truly yours,

Colleen Medeiros

Colleen Medeiros, P.E.
Project Manager

OSD LLC

dba OSD Engineering Consultants

822 Massachusetts Ave
Lexington, MA 02420
Phone 781-454-5271 Fax 888-890-4756

INVOICE

INVOICE #1339
DATE: JUNE 19, 2018

TO:
Mr. Kenneth Buckland
Director of Planning and Community Development
Town of Wareham
54 Marion Road
Wareham, MA 02571
508.291.3100 x 6501

FOR:
Woodland Cove Development Peer Review
Professional Services

DESCRIPTION	AMOUNT
Professional Services through June 15, 2018	
S. Osborne 58 hours at $168.56/hr	$9,776.48
TOTAL	$9,776.48

Make all checks payable to OSD LLC
Payment is due within 30 days.
If you have any questions concerning this invoice, contact Sean Osborne at 781-454-5271 or sosborne@osd-ec.com

Thank you for your business!

TOWN OF WAREHAM

54 Marion Road
Wareham, MA 02571
508-291-3100, Ext. 3101

Via certified: 7016 2140 0001 0946 2748

June 15, 2017

Rebecca Frawley Wachtel
Director HOME
Department of Housing and Community Development
100 Cambridge Street
Suite 300
Boston, MA 02114

Re: Woodland Cove 40B Proposal/ Project Eligibility Review

Dear Ms. Frawley Wachtel

I write on behalf of the people and the Board of Selectmen of the Town of Wareham Board in relation to the above-referenced affordable housing development project. Please be advised that the Town cannot support this proposal, for the following reasons:

a) as proposed, the 174 unit project size with most of the units containing multiple bedrooms is simply too large for our town of approximately 22,000 residents to absorb. Furthermore, the proposed buildout of all units within two or three years is too much and too fast for our Town to reasonably accommodate and sustain within our limited public safety, educational and social services resources;

b) the Town's history with projects greater than 30 units has been substantially negative, with such projects creating additional and unsustainable drains on police, emergency medical services, school resources and fire and water districts;

c) the Town has carefully hoarded sewer capacity in the hope that remaining capacity can be used to support desperately needed business development and job creation, which capacity would be devoured by a project of this size;

o) although Wareham's housing stock is presently approximately 7.7% affordable and thus we have not yet met our 10% affordable quota pursuant to G.L. c.40B, we are much closer to it than most other local municipalities, as for almost 50 years we have seen significant affordable housing development occur and over that time have sustained the burdens associated with accepting thousands of new non-residents facing significant socio-economic challenges.

This list of reasons in opposition to the proposed project was developed from lengthy consideration of the proposed housing development by the Wareham Board of Selectmen, Town Administration, and most importantly comments received from our citizenry, whether via email, social media commentary or direct commentary to the Board of Selectmen. To date, we have not received any direct formal commentary supporting this project.

Furthermore, the Wareham Board of Selectmen and Town Administration are unwilling to commit any public funding, whether via Community Preservation funds or other means, to support the proposed project.

In closing, thank you for considering our commentary, and, as you review the project within the Department of Housing and Community Development, we hope that you will honor and respect the overwhelming opposition to this project within the Town of Wareham by not offering state funding support.

Very truly yours,

Peter W. Teitelbaum, Esq.
Chairman, Wareham Board of Selectmen

cc: Sen. Marc Pacheco
Rep. Susan Williams Gifford
Chrystal Kornegay, Undersecretary, Office of Housing and Community Development
Chief Ray Goodwin, Onset Fire Dept.
Chief Robert McDuffy, Wareham Fire Dist.
Wareham Board of Selectmen
Derek Sullivan, Town Administrator

DAKOTA PARTNERS
1264 Main Street
Waltham, MA 02451
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www.DakotaPartners.net

Transmittal

Transmittal No. 005

Sent To	
Company:	Town of Wareham
Name:	Zoning Board of Appeals
Address:	54 Marion Road Wareham, MA 02571
Phone:	508-291-3100 ext. 6500
Fax:	
E-mail:	

Sent From	
Company:	Alycia Garcia
Name:	Dakota Partners
Address:	1264 Main Street Waltham, MA 02451
Phone:	781-899-4002 ext. 13
Fax:	
E-mail:	alyciagarcia@dakotapartners.net

Project Information	Woodland Cove
Project:	3102 Cranberry Highway
Address:	Wareham, MA 02532

Sent Date:		06/13/2018	
Sent Via:			
	E-Mail		**Fax**
X	**Hand Delivered**		**UPS**
	USPS		**FedEx**
Tracking #:			

Subject
Application for Comprehensive Permit

Comments
Sewer Analysis Fee

Item #	# of Copies	Description
1	1	Check No. 2025, Town of Wareham/Sewer Review Fee

RECEIVED
JUN 13 2018

Transmitted For:					
	Approval		**Information**		**Signature**
X	**Your Records**		**Selection**		**Other**

OSD Engineering Consultants

June 13, 2018

Mr. Kenneth Buckland
Director of Planning and Community Development
Town of Wareham
54 Marion Road
Wareham, MA 02571

Re: Peer Review of Woodland Cove Project

Dear Mr. Buckland:

We have reviewed the information provided by the proponent and their engineers.

1. Woodland Cove Comprehensive Permit plans dated January 12, 2018
2. BSC Group Memorandum dated April 19, 2018
3. Supplemental Data from BSC Group in emails dated May 9, 2018 and June 12, 2018

The following comments are in response to this information.

System Impact

Using the average day, maximum day and fire flow demands provided by BSC Group, the impact of the development on the Onset Fire District's (OFD) water distribution system was simulated using a hydraulic model. Our analysis concluded that the current distribution system can meet the proposed demands with no significant impact on the District's existing customers, when all wells are operational.

To mitigate the potential for contamination of the OFD water source, we recommend that the developer institute guidelines for the residents and landscapers to prohibit the use of pesticides and limit the storage of fuel oil at the residences.

Due to the potential for debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns to get into the infiltration systems we recommend that the proponent develop and provide a permanent well monitoring plan. This plan should include

a. Installing monitoring wells north or and adjacent to the project site prior to construction
b. Monthly collection and analysis of water quality samples.
c. Electronic and paper copies of test results to be provided to Onset Fire District Water Department and Town of Wareham Planning Office.

238 Bedford St
Suite 9
Lexington, MA 02420

Phone: 781-538-4636
Fax: 781-538-4637
www.osd-ec.com

Plans

Sheet C-5.1

2. Phase 1 water main should include a minimum of two hydrants. One should be installed on the Woodland Cove property between Red Brook Road and Bldg A. The other should be installed at the dead end with one full length of pipe and a restrained cap after the dead-end hydrant.
3. If possible, move the underground infiltration system, installed in Phase 1, out of the R-130 zone.

Sheet C-5.2

1. Phase 2 water main should include a minimum of two hydrants. One should be installed on the Woodland Cove property between Cranberry Highway and Bldg F. The other should be installed at the dead end with one full length of pipe and a restrained cap after the dead-end hydrant.

Sheet C-6.2

1. Water Service Connection Detail
    a. OFD requests that all new pipe be DI
    b. Service tap should be shown at ten or two o'clock
    c. Service pipe should be PE service tubing

Sheet C-6.3

1. Concrete Thrust Block for Pressure Pipe
    a. All water main bends, dead ends and tees shall have mechanical joints with retainer glands.
    b. A minimum of one pipe to pipe joint shall be mechanically restrained before and after all water main fittings.

Sheet C-6.4

1. Fire Hydrant & Valve
    a. Hydrants to be painted Onset Fire District Red with Scotchlite Reflective Paint
    b. Add note – For hydrants installed at dead ends of water mains: install valves with restrained joints on both sides of the hydrant tee and one full length of pipe between valve and mechanically restrained cap or plug.

If you have any questions, please call me or e-mail me at sosborne@osd-ec.com.

Regards,

Sean D. Osborne

Sean D. Osborne, PE
Principal

TEC
The Engineering Corp

146 Dascomb Road
Andover, MA 01810
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PO Box 249
Hampton, NH 03842
603.601.8154

TheEngineeringCorp.com

CLIENT AUTHORIZATION

☒ New Contract Project No.: _____

☐ Amendment No.: Date: May 14, 2018

Project Name: Site Circulation & Transportation Engineering Peer Review
3102 Cranberry Highway – Wareham, MA

Client: Mr. Kenneth Buckland, AICP
Director of Planning and Community Development
Town of Wareham
54 Marion Road
Wareham, MA 02571

Fee Proposal	
Initial Peer Review/Meetings	$4,700.00
Follow-up Review (Estimated)	$1,200.00
Expenses and Administration	Included
TOTAL	$5,900.00

Requested by: Client

☒ Lump Sum ☒ Time & Expenses
☐ Cost + Fixed Fee ☐ Other
Estimated Date of Completion: June 15, 2018 (Initial Review)

Scope of Services:

The Town of Wareham Zoning Board of Appeals (Client) is retaining TEC, Inc. to perform transportation engineering services associated with the review of a comprehensive permit application for the proposed residential development at 3102 Cranberry Highway (Route 6) in Wareham. TEC will conduct a review of the Applicant's traffic study and site plan and prepare a letter summarizing the findings of a peer review for submission to the Zoning Board of Appeals. The following provides a summary of the scope of services associated with this effort:

Task 1 – Traffic Engineering Peer Review ($4,700 Lump Sum)

- Perform a site visit to review and confirm the current traffic operations and physical geometry of the roadways and intersections surrounding the site, reasonableness of sight distance throughout the area and at potential driveway locations, and identify potential areas of concern.
- Conduct a review of the traffic report, which will focus on the following items:
  - Adequacy of study area presented within the report
  - Adequacy of traffic volume count data collected and submitted within the report
  - Applicability of adjustment factors, background growth factors, modeling assumptions, and study methodology
  - Comparison of methodologies used for traffic generation and trip distribution to Massachusetts Department of Transportation (MassDOT), Town of Wareham, and industry (ITE, AASHTO) standards
  - Perform a general safety review, including crash data available from MassDOT, sight distances and roadway geometry
  - Relative accuracy of the traffic volume calculations
  - Confirm input assumptions and accuracy of the level of service and queueing calculations
  - Assess the projected traffic impacts of the proposed development on the immediately adjacent intersections
  - Assess the adequacy of proposed mitigation measures and provide recommendations for any off-site improvements to mitigate the project-related traffic impacts
- Conduct a review of the submitted site plans, which will focus on the following items:
  - Adequacy of pedestrian, bicycle, and vehicle accommodations throughout the site
  - Adequacy of access/egress for public safety and emergency vehicles, specifically circulation throughout the site for a Town of Wareham Fire Department preferred design vehicle

- General safety characteristics of proposed access/egress in terms of sight distance, turning radii, configuration, appropriate signage, lane markings, and traffic control
- Review of the site plan for pedestrian and vehicular circulation considerations and identify potential areas of conflict or concern
- Adequacy of proposed parking supply in relation to Town of Wareham requirements, industry standards, local sources and other similar developments

- Prepare a technical letter documenting the results of TEC's review.
- Attend one staff meeting or internal design review meeting and one (1) public hearing with the Zoning Board Appeals to present the results of the traffic peer review.

Task 2 – Follow-up Review (Response to Comments) ($1,200 Estimated)

TEC anticipates that the Applicant's site engineer and/or traffic engineer will prepare a Response to Comments document to respond to the peer review report discussed above. TEC has assumed that the Applicant will issue one (1) Response to Comments document, for which TEC will potentially provide additional peer review services. Following review of the Response to Comments documents, TEC will prepare a final peer review report. Copies of each peer review report will be delivered to the Wareham ZBA within approximately two (2) weeks of receipt of the Response to Comments document.

TEC will not exceed a total fee of $5,900.00 for the labor and expenses for Tasks 1 and 2 noted above, unless approved by the Client. If requested by the Client, TEC staff will be available to perform supplemental services or attend additional project-related meetings.

Note:

Should the Applicant's consultants prepare additional response to comments or supplemental analysis documents, TEC will be available to review these documents at a commensurate increase in the labor fee. TEC will secure written approval from the Client prior to completing any out-of-scope services. Email authorizations are acceptable as a Notice-to-Proceed on subsequent tasks.

Time associated with the scope of services for Task 1 listed above will be billed on a lump sum basis. Task 2 and any supplemental services will be billed in accordance with the Engineer's standard billing rate and fee schedule on a time-and-expenses basis.

Prepared by: Kevin R. Dandrade, PE, PTOE **Project Deputy PM:** Elizabeth Oltman, PE

Please execute this Client Authorization for TEC, Inc. to proceed with the above scope of services at the stated estimated costs. No services will be provided until it is signed and returned to TEC.

☒ Subject to attached terms & conditions ☐ Subject to terms & conditions in our original agreement

TEC, Inc. Authorization	**Client Authorization** *(Please sign original & return)*
By	By
Title Principal	Title DIRECTOR OF PLANNING & COMMUNITY DEVEL.
Date May 14, 2018	Date 5/24/18

TEC The Engineering Corp

Part II

TEC, Inc.
TERMS AND CONDITIONS OF AGREEMENT
(Numbers 1 thru 25)

The engagement of TEC, Inc. (TEC) by the Client is under the following terms and conditions. These terms and conditions are integral to the collective Agreement between Client and TEC.

1. The fee estimate for the proposed Scope of Services is valid for 45 days from the date of Proposal.

2. Payment to TEC is the sole responsibility of signatory of this Agreement and is not subject to third party agreements.

3. All schedules in the Scope of Services commence upon receipt of a signed Agreement and, if requested, a retainer. All retainer amounts will be applied to the last invoice.

4. Invoices will be rendered monthly and become due upon receipt. Any invoice outstanding for more than 30 days after date of invoice will be subject to a financing charge of 1-1/2 percent per month.

5. Should it become necessary to utilize legal or other resources to collect any monies rightfully due for services rendered under this Agreement, TEC shall be entitled to full reimbursement of all such costs.

6. Invoice payments must be kept current for services to continue. If the Client fails to pay any invoice due to TEC within 30 days of the date of invoice, TEC may, without waiving any other claim or right against Client, suspend services under this Agreement until TEC has received all amounts due TEC and its Consultants and Subcontractors.

If TEC is performing services for the Client under multiple projects, invoice payments must be kept current on all projects. Client acknowledges TEC's right to suspend services and withhold plans and documents, as provided above, if payments are not current on all projects. If services are suspended for 30 days or longer, upon resuming services TEC shall be entitled to expenses incurred in the interruption and resumption of its services. If services are suspended for 90 days, TEC shall be entitled to expenses incurred in the interruption and resumption of its services and fees for remaining services shall be equitably adjusted.

7. TEC agrees to carry the following insurance during the term of this Agreement:

- Workmen's Compensation and Employer's Liability Insurance in compliance with statutory limits.
- Comprehensive General Liability Insurance including Products Completed, Contractual, Property, and Personal Injury coverage with combined single limits of $1,000,000 per occurrence and $2,000,000 in the aggregate.
- Excess Umbrella Coverage for Personal Injury, Bodily Injury, and Property Damage with a limit of $1,000,000 per claim and in the aggregate.
- Professional Liability Insurance with a limit of $1,000,000 per claim and in the aggregate.
- Automobile Liability Insurance including non-owned and hired automobiles with the following limits:
    - o Bodily Injury $500,000 each person, $500,000 each occurrence
    - o Property Damage $100,000 each occurrence

Certificates of insurance will be furnished upon request. If the Client requires additional insurance coverage, and it is available, Client agrees to reimburse TEC for such additional expense.

8. The Client and TEC shall at all times indemnify and save harmless each other and their officers, and employees on account of any claims, damages, losses, litigation, expenses, counsel fees, and compensation arising out of any claims, damages, personal injuries and/or property losses sustained by or alleged to have been sustained by any person or entity, to the extent caused by the negligent acts, errors or omissions of the indemnifying party, its employees, or subcontractors in connection with the Project, and/or under this Agreement.

9. TEC shall not be responsible for failure to perform or for delays in the performance of services which arise out of causes beyond the control and/or without the fault or negligence of TEC.

10. TEC shall be entitled to rely on the accuracy and completeness of data, reports, surveys, requirements and other information required to be provided by Client under this Agreement.

11. Client agrees to the fullest extent permitted by law, to indemnify and hold harmless TEC, its officers, employees and subconsultants from and against any and all claims, suits, demands, liabilities costs, including reasonable attorneys fees and defense costs caused by, arising out of or in any way connected with the detection, presence, handling, removal, abatement, or disposal of any asbestos or hazardous or toxic substances, products or material that exist on, about or adjacent to the job site.

12. TEC's services will be performed on behalf of and solely for the benefit and exclusive use of Client for the limited purposes set forth in the Agreement. Client acknowledges that TEC's services require decisions which are not based upon science, but rather upon judgmental considerations. Client may not delegate, assign, sublet or transfer its duties or interest in this Agreement without the written consent of TEC.

13. In the performance or furnishing of professional services hereunder, TEC, and those it is responsible for, shall exercise the degree of skill and care customarily accepted as good professional practices and procedures by members of the same profession currently practicing under similar conditions in the same locality ("Standard of Care").

Consistent with this Standard of Care, the services shall conform to applicable laws, codes, ordinances and regulations of any governmental agency having jurisdiction over the project, at the time services are rendered. TEC shall perform its services as expeditiously as is consistent with the Standard of Care and with the orderly progress of the Work.

14. TEC shall not be required to sign any documents, no matter by whom requested, that would result in TEC's having to certify, guaranty or warrant the existence of conditions that TEC cannot ascertain. Any certification provided by TEC shall be provided based on TEC's knowledge, information and belief subject to the preceding sentence, and shall be given in TEC's professional opinion consistent with the Standard of Care. TEC shall be compensated for any work necessary to verify project compliance with regulatory standards for purposes of such certification.

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The Engineering Corp

15. Client hereby agrees that to the fullest extent permitted by law, TEC's total liability to Client and any persons or entities claiming by, through or under the Client, for any and all injuries, claims, losses, expenses, or damages whatsoever arising out of or in any way related to the Project and/or this Agreement from any cause or causes including, but not limited to TEC's negligence, errors, omissions, strict liability, statutory liability, indemnity obligation, breach of contract or breach of warranty shall not exceed the lesser of $50,000 (fifty thousand dollars) or contract value.

16. All documents including Drawings and Specifications (whether in hard or electronic form) prepared by TEC pursuant to the Agreement are instruments of service with respect to the Project. They are not intended or represented to be suitable for reuse by the Client or others on extensions of the Project or on any other Project. Any reuse by Client or a third person or entity authorized by Client without written verification or adaptation by TEC for the specific purpose intended will be at the Client's sole risk and without liability or legal exposure to TEC; and the Client, shall release, indemnify and hold harmless TEC from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle TEC to additional compensation at rates to be agreed upon by TEC and the third person or entity seeking to reuse said documents.

If any information hereunder is provided in electronic format, Client recognizes that such plans, documents or other information recorded on or transmitted as electronic media, including CADD documents ("Electronic Documents") are subject to undetectable alteration, either intentional or unintentional, due to, among other causes, transmission, conversion, media degradation, software error, or human alteration. Electronic Documents are provided to Client for informational purposes only and not as record documents.

17. To the extent permitted by law, TEC retains the copyright in all written work products, including plans, specifications, calculations, computer programs, and computer generated materials in any form, produced in connection with the work under this agreement, unless otherwise agreed to in writing by an authorized TEC representative. Subject to Term No. 16 above, TEC licenses to Client the use of all written work products, including plans, specifications, calculations, and computer generated materials in any form, produced in connection with the work under this agreement on a non-exclusive basis.

18. All questions in dispute under this Agreement shall be submitted to non-binding mediation. On the written notice of either party to the other of the election to submit any dispute under this Agreement to mediation, each party shall designate their representative and shall meet within ten (10) days after the service of the notice. The parties themselves shall then attempt to resolve the dispute within ten (10) days of meeting. Should the parties themselves be unable to agree on a resolution of the dispute, then the parties shall proceed with mediation in accordance with the mediation rules of the American Arbitration Association. The cost of mediation shall be borne equally by both parties. This process shall be considered as a condition precedent to moving to a more formal or judicial process.

19. Notwithstanding any other provision of this Agreement, neither party shall be liable to the other for any incidental, special, indirect or other consequential damages incurred due to the fault of the other party regardless of the nature of the fault or whether it was committed by the Client or TEC, or their employees, subconsultants, or subcontractors. Consequential damages include, without limitation, liability for loss of use of the Project or existing property, loss of profits, loss of production or business interruption.

20. In entering into this Agreement, Client has relied only upon the representations set forth in this Agreement. No verbal warranties, representations or statements shall be considered a part of this Agreement or a basis upon which the Client relied in entering into this Agreement. No statements, representations, warranties or understandings, unless contained herein, exist between Client and TEC.

21. Nothing contained in this Agreement shall create a contractual relationship with, or a cause of action in favor of, a third party against either the Client or TEC. TEC's services under this Agreement are being performed solely for the benefit of the Client and no person or other entity shall have any claim against TEC because of this Agreement. In addition, nothing herein shall be construed as creating a contractual relationship between the Client and any TEC employee, representative or consultant. The Client agrees that in the event of a dispute regarding this Agreement or the services rendered by TEC hereunder, the Client shall only seek recourse against TEC and waives any right to pursue a claim against TEC's individual directors, officers or employees.

22. Any taxes or fees, enacted by local, state or federal government and based on gross receipts or revenues, will be invoiced to and payable by Client as an additional amount due under this Agreement.

23. This Agreement shall be governed and construed in accordance with the laws of the Commonwealth of Massachusetts.

(The following terms are applicable for Project sites located in Massachusetts)

24. In accordance with the Massachusetts General Laws Chapter 21E, the performance of the services contained in this Agreement may require the engagement of a Licensed Site Professional (LSP) registered with the Commonwealth of Massachusetts under Massachusetts General Law Chapter 21A and the regulations promulgated by the Massachusetts Department of Environmental Protection (MADEP) thereunder (collectively the LSP Program). These laws and regulations place upon the LSP certain professional obligations owed to the public, including in some instances, a duty to disclose the existence of certain environmental contaminants to the MADEP. In the event that any site for which TEC has provided LSP services is audited by the Massachusetts Department of Environmental Protection (MADEP) pursuant to the provisions of the Massachusetts Contingency Plan, TEC shall be entitled to additional compensation to provide such services as may be necessary to assist Client in its response to DEP.

25. Client understands and acknowledges that in the event the LSP's obligations under the LSP Program conflict in any way with the terms and conditions of this Agreement or the wishes or intentions of the Client, the LSP is bound by law to comply with the requirements of the LSP Program. Accordingly, Client recognizes that the LSP shall be immune for all civil liability resulting from any alleged and/or actual conflict with the LSP Program. Client also agrees to hold TEC and its LSP harmless for any claims, losses, damages, fines or administrative, civil or criminal penalties resulting from the LSP's fulfillment of its obligations under the LSP Program.

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Kenneth Buckland
Director of Planning and Development
Town of Wareham
54 Marion Road
Wareham, MA 02571

June 6, 2018

Attn: Zoning Board of Appeals

Ref. T0785

Re: 3102 Cranberry Highway Comprehensive Permit
Transportation Peer Review

Dear Mr. Buckland and ZBA Members:

On behalf of the Town of Wareham, TEC, Inc. reviewed documents as part of the transportation engineering peer review for the Comprehensive Permit Application for the proposed Woodland Cove residential development project to be located at 3102 Cranberry Highway. The project consists of constructing 174 apartment units with 260 parking spaces. The Applicant proposes access to the site via one full movement driveway onto Red Brook Road and one right turn in / right turn out driveway onto Cranberry Highway (Route 6).

The following documents were received as part of our review:

- *Application for Comprehensive Permit* – Woodland Cove Apartments, prepared by Dakota Partners, Inc.
- *Woodland Cove Comprehensive Permit Plans*; prepared by BSC Group, dated January 12, 2018
- *Traffic Impact Study Residential Development– 3102 Cranberry Highway (Route 6)*; prepared by McMahon Associates, Inc., dated November 2017.

TEC completed a review of these documents for the Town of Wareham, and the following provides a summary of the comments that compiled during our review:

Transportation Impact Evaluation

1. Study Area – The Traffic Impact Study (TIS) included the following intersections within the study area: Red Brook Road with the site driveway, Cranberry Highway and the site driveway and Red Brook Road / Cranberry Highway. TEC concurs with the scope of the study area given the nature of the Route 6 corridor and the

pending MassDOT improvements. Additionally, there were no notable staff concerns regarding the study area at the design review meeting on May 17.

2. Traffic Counts - Traffic counts utilized within the traffic analysis were conducted in January and May 2017 during a period in which school was in session. The Starlight Motel, currently on the site, was operational at the time of the May 2017 counts. The TIS also indicates that the January 2017 traffic volumes were increased by 24% to reflect an average month and the May 2017 traffic volumes were "unadjusted" as May represents a higher than average month condition. While Wareham experiences a significant seasonal peak traffic volume during the summer months, it is an industry standard in Massachusetts to use the "average month" condition to determine the potential impact of the proposed development on the adjacent roadway system. TEC concurs with the use of these counts based on MassDOT guidelines.

   2024 No Build future conditions were projected using a 1% per year compounded growth rate as confirmed by the Southeastern Regional Planning and Economic Development District (SRPEDD). Further, the construction of improvements to the intersection of Red Brook Road / Cranberry Highway by MassDOT was considered and traffic rerouted to anticipate the signalization of this intersection. TEC concurs with this methodology based on MassDOT guidelines.

3. Site Trip Generation – The TIS uses the standard fitted curve equations published in the ITE publication, *Trip Generation, 9th Edition* for land use code (LUC) 220 – Apartment to estimate the traffic generated by the 174 apartment units. TEC concurs with the use of this methodology.

   The current use on the site, the Starlight Motel, generates traffic during the weekday morning and evening peak hours. Credit was taken for these existing trips as counted in May 2017 within the TIS. TEC notes that the trips counted at the existing Motel are slightly lower than the ITE projections for this land use. No multi-modal trip reduction is applied. TEC concurs that this is appropriate for determining the impact of new traffic on the adjacent roadway system.

4. Trip Distribution – The traffic generated by the proposed project was distributed onto the adjacent roadway system based upon Journey to Work Census data. TEC concurs that this is appropriate as long as MassDOT constructs the traffic signal at Red Brook Road. Without the planned traffic signal, the Board should expect more Cape-bound trips to use Red Brook Road to the northeast rather than incur additional delay associated with the current turn restrictions at the intersection.

5. Capacity and Queue Analysis - TEC generally concurs with the capacity and queue analysis provided as part of the Traffic Impact Study utilizing the Highway Capacity Manual 2010 (HCM 2010) methodology.

   The TIS indicates that, with the construction of MassDOT's proposed improvements at Red Brook Road / Cranberry Highway in 2019, the intersection will operate with acceptable levels of service in the No Build and Build condition, with the exception of the eastbound left turn / U-turn movement during the evening peak hour. The

TIS indicates that the proposed development will have a minimal impact on the adjacent roadway system.

6. Site Driveway – The existing Starlight Motel has a wide curb cut onto Cranberry Highway. The proposed right turn in / right turn out driveway into the site is located farther from the new signalized intersection and provides a reduced curb cut. MassDOT has exclusive jurisdiction over all curb cuts that intersect with State Highway Layout (SHLO). The Town should consider including a condition to any approval of the site plan requiring completion of an approved MassDOT Permit to Access State Highway prior to issuance of a Building Permit.

   A full movement driveway onto Red Brook Road is proposed. No left turn lane is proposed to be provided into the site driveway from Red Brook Road. The location of the driveway within 200 feet of the signalized intersection of Red Brook Road / Cranberry Highway is of concern. Vehicles attempting to enter the site, detailed as approximately 50 during the evening peak hour, will queue within the travel lane of northbound Red Brook Road, potentially causing through vehicles to queue onto Route 6/28. TEC recommends the applicant consider restricting this driveway to right turn in / right turn out movements. The left turns entering the site at this driveway could reroute to the Cranberry Highway site driveway as a U-turn at the traffic signal. The minimal site traffic anticipated to be destined to/from the north on Red Brook Road can be diverted to other local roadways.

7. Sight Distance - The sight distances reported in Table 3 of the TIS are measured in accordance with the American Association of State Highway and Transportation Officials (AASHTO) requirements. Although TEC concurs with the sight distances measured in excess of AASHTO minimum recommendations, the site plans should be revised to show any sight lines along the property frontage along Red Brook Road and Cranberry Highway. The sight line clear areas should be compared against the proposed Planting Plan to confirm that the sight lines will remain clear as reported in the traffic study. The Applicant's engineer should confirm that the fence or other vegetation on the abutting residential property will not impede the sight lines.

8. Pedestrian Access – The TIS indicates that the signalization of the intersection of Red Brook Road / Cranberry Highway application includes construction of sidewalk along both directions of Cranberry Highway and Red Brook Road, with crosswalks on two legs of the intersection. Sidewalk is shown connecting the residential development with Cranberry Highway. Given the orientation of the site to the signalized intersection, the Applicant should construct sidewalks along both sides of each driveway; this will limit pedestrian movements crossing the driveway openings and provide better connectivity between the site, area retail land uses, and other future sidewalks, if desired, along Red Brook Road.

   The site plans should depict any proposed accommodations for a school bus pick-up and drop-off location along the site frontage. This could include some sections of new granite curbing and a cement concrete sidewalk surface to provide a visual difference for the pedestrian space adjacent to internal circulation areas.

9. Recreation Space – The ZBA should consider requesting an alternative layout plan that seeks to consolidate the recreation space at the north end of the site, adjacent to other existing open space. This could reduce the potential for pedestrian crossing movements along the main site driveways.

10. Parking – The Town of Wareham Zoning By-law requires 1.5 parking spaces for each apartment unit with 1 bedroom and 2.0 parking spaces for each unit with 2 or more bedrooms. The proposed 176-unit development is proposed to consist of 32 units with one bedroom and 142 units with 2 or more bedrooms, equating to a By-law requirement of 332 parking spaces, or approximately 1.9 spaces per unit overall. The Applicant is proposing to provide 260 parking spaces for the 174 apartment units, a ratio of 1.5 spaces per unit. Data found within the ITE publication, *Parking Generation, 4th Edition* for LUC 221 – Low/Mid-Rise Apartment indicates an 85th percentile parking demand ratio of 1.94 spaces per unit, or 341 parking spaces for the 174 apartment units. The Applicant should provide justification for the provision of the parking supply below the By-law requirement. The Board should closely review the adequacy of the visitor parking supply, knowing that there is significant potential for overflow parking to occur along on-site travel aisles or spill over onto adjacent roadways.

11. Traffic Mitigation – TEC concurs that the level of traffic impact from the 174 residential units does not warrant any specific physical off-site mitigation at this time.

Site Plan Characteristics

Note that aspects of the site plans that enter State Highway Layout (SHLO) are under the purview of MassDOT. Although many of the following comments relate to the overall site and driveway locations, TEC has provided specific recommendations and comments for areas within SHLO that MassDOT are anticipated to ask as part of their Permit to Access State Highway review.

1. The Applicant should provide turning templates showing the ability of refuse and delivery vehicles to access, circulate, and egress the site through the circulation pattern without leaving the paved surface. The refuse vehicle shall be able to access the site and proposed dumpster enclosure without encroachment over the double yellow center lines of either Red Brook Road or Cranberry Highway. With increasing use of online shopping, we recommend a dedicated loading area for express delivery vehicles, such as UPS or Fedex, for this site.

2. The site plans should be revised to provide for additional STOP-signs and STOP-bars at the ends of the parking aisles that intersect the aisles that connect to the adjacent streets. Other channelization markings should also be considered to better define the desired pedestrian crossing location when exiting the dead-end parking area on the northeast corner of the site plan.

3. Sidewalk connections should be provided along the Red Brook Road access driveway and a crosswalk provided at the beginning of the parking areas. The

Applicant should strongly consider speed control measures, such as a raised crosswalk given the vehicle speeds for those turning from Route 6/28.

4. The Applicant should coordinate with the Onset Fire Department for preferred locations and sign requirements for fire lanes within the site. The layout currently does not provide emergency vehicle access to the rear of the multiple structures on the site as routinely provided for dense residential structures.
5. The Applicant should provide vehicle turning templates to verify that a Onset Fire Department apparatus can circulate freely throughout the site in the event of an emergency.
6. The Applicant should coordinate with the Onset Fire Department on whether direct access to the rear of the buildings is required given the number of structures and the limited access availability.

If you have any questions regarding the peer review, please do not hesitate to contact us at (978) 794-1792. Thank you for your consideration.

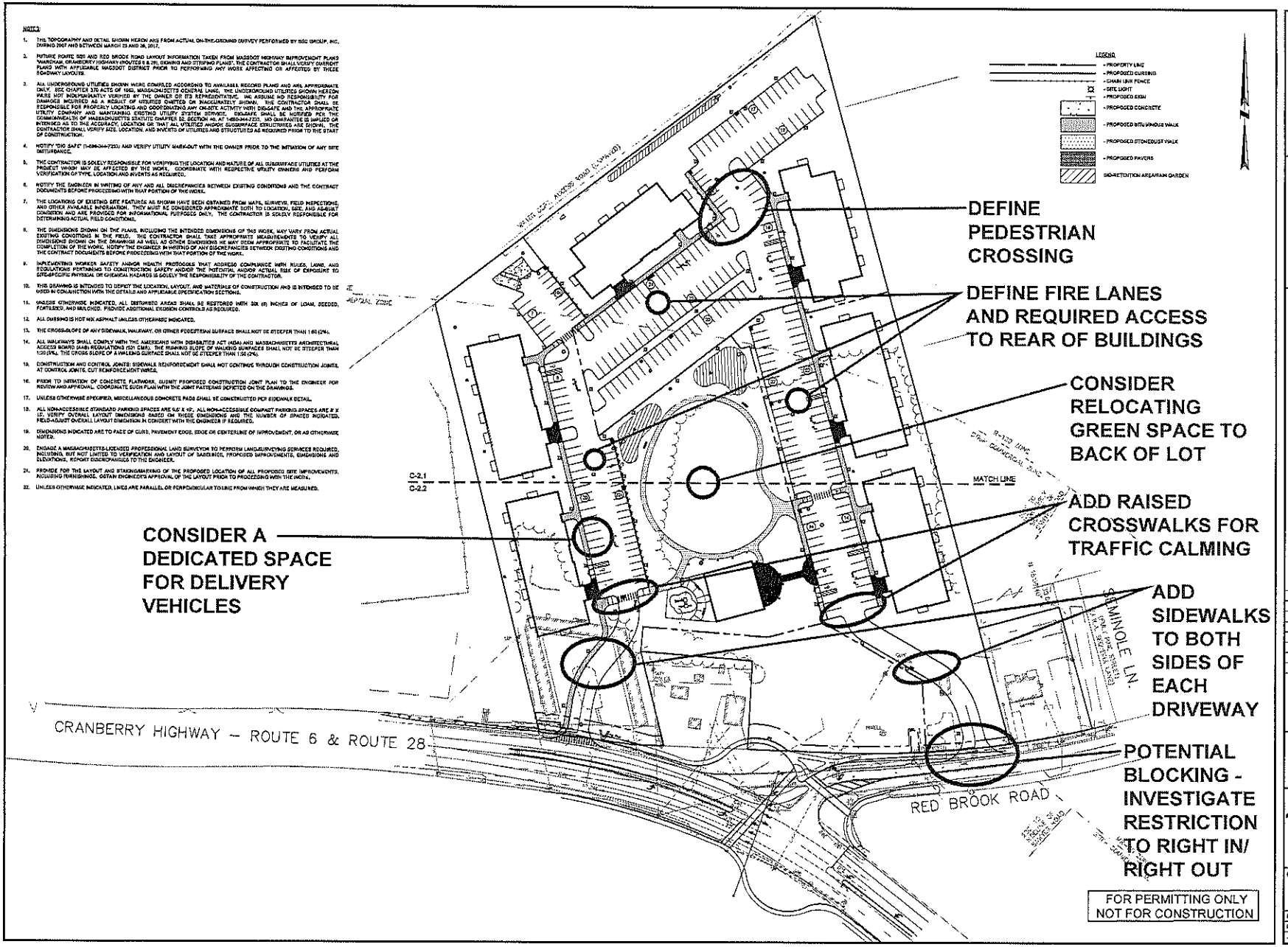
Sincerely,
TEC, Inc.
*"**T**he **E**ngineering **C**orporation"*

Kevin R. Dandrade, PE, PTOE
Principal

Elizabeth Oltman, PE
Senior Traffic Engineer

NOTES

1. THE TOPOGRAPHY AND DETAIL SHOWN HEREON ARE FROM ACTUAL ON-THE-GROUND SURVEY PERFORMED BY BSC GROUP, INC. DURING 2007 AND BETWEEN MARCH 23 AND 26, 2012.
2. FUTURE ROUTE 6/28 AND RED BROOK ROAD LAYOUT INFORMATION TAKEN FROM MASSDOT HIGHWAY IMPROVEMENT PLANS "WAREHAM, CRANBERRY HIGHWAY (ROUTES 6 & 28), SIGNING AND STRIPING PLANS". THE CONTRACTOR SHALL VERIFY CURRENT PLANS WITH APPLICABLE MASSDOT DISTRICT PRIOR TO PERFORMING ANY WORK AFFECTING OR AFFECTED BY THESE ROADWAY LAYOUTS.
3. ALL UNDERGROUND UTILITIES SHOWN WERE COMPILED ACCORDING TO AVAILABLE RECORDS PLANS AND ARE APPROXIMATE ONLY. BSC CHAPTER 370 ACTS OF 1982, MASSACHUSETTS GENERAL LAWS, THE UNDERGROUND UTILITIES SHOWN HEREON MUST BE INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. INC ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INADEQUATELY SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY LOCATING AND COORDINATING ANY ON-SITE ACTIVITY WITH DIG-SAFE AND THE APPROPRIATE UTILITY COMPANY AND MAINTAINING EXISTING UTILITY SYSTEM SERVICE. DIG-SAFE SHALL BE NOTIFIED PER THE COMMONWEALTH OF MASSACHUSETTS STATUTE CHAPTER 82, SECTION 40, AT 1-800-344-7233. NO GUARANTEE IS IMPLIED OR INTENDED AS TO THE ACCURACY, LOCATION OR THAT ALL UTILITIES AND/OR SUBSURFACE STRUCTURES ARE SHOWN. THE CONTRACTOR SHALL VERIFY SIZE, LOCATION, AND INVERTS OF UTILITIES AND STRUCTURES AS REQUIRED PRIOR TO THE START OF CONSTRUCTION.
4. NOTIFY "DIG SAFE" (1-888-344-7233) AND VERIFY UTILITY MARK-OUT WITH THE OWNER PRIOR TO THE INITIATION OF ANY SITE DISTURBANCE.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE LOCATION AND NATURE OF ALL SUBSURFACE UTILITIES AT THE PROJECT WHICH MAY BE AFFECTED BY THE WORK. COORDINATE WITH RESPECTIVE UTILITY OWNERS AND PERFORM VERIFICATION OF TYPE, LOCATION AND INVERTS AS REQUIRED.
6. NOTIFY THE ENGINEER IN WRITING OF ANY AND ALL DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK.
7. THE LOCATIONS OF EXISTING SITE FEATURES AS SHOWN HAVE BEEN OBTAINED FROM MAPS, SURVEYS, FIELD INSPECTIONS, AND OTHER AVAILABLE INFORMATION. THEY MUST BE CONSIDERED APPROXIMATE BOTH TO LOCATION, SIZE, AND ABSOLUTE CONDITION AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL FIELD CONDITIONS.
8. THE DIMENSIONS SHOWN ON THE PLANS, INCLUDING THE INTENDED DIMENSIONS OF THE WORK, MAY VARY FROM ACTUAL EXISTING CONDITIONS IN THE FIELD. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASUREMENTS TO VERIFY ALL DIMENSIONS SHOWN ON THE DRAWINGS AS WELL AS OTHER DIMENSIONS HE MAY DEEM APPROPRIATE TO FACILITATE THE COMPLETION OF THE WORK. NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK.
9. IMPLEMENTING WORKER SAFETY AND/OR HEALTH PROTOCOLS THAT ADDRESS COMPLIANCE WITH RULES, LAWS, AND REGULATIONS PERTAINING TO CONSTRUCTION SAFETY AND/OR THE POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE-SPECIFIC PHYSICAL OR CHEMICAL HAZARDS IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
10. THIS DRAWING IS INTENDED TO DEPICT THE LOCATION, LAYOUT, AND MATERIALS OF CONSTRUCTION AND IS INTENDED TO BE USED IN CONJUNCTION WITH THE DETAILS AND APPLICABLE SPECIFICATION SECTIONS.
11. UNLESS OTHERWISE INDICATED, ALL DISTURBED AREAS SHALL BE RESTORED WITH SIX (6) INCHES OF LOAM, SEEDED, FERTILIZED, AND MULCHED. PROVIDE ADDITIONAL EROSION CONTROLS AS REQUIRED.
12. ALL PAVING IS HOT MIX ASPHALT UNLESS OTHERWISE INDICATED.
13. THE CROSS-SLOPE OF ANY SIDEWALK, WALKWAY, OR OTHER PEDESTRIAN SURFACE SHALL NOT BE STEEPER THAN 1:50 (2%).
14. ALL WALKWAYS SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) REGULATIONS (521 CMR). THE RUNNING SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 1:20 (5%). THE CROSS SLOPE OF A WALKING SURFACE SHALL NOT BE STEEPER THAN 1:50 (2%).
15. CONSTRUCTION AND CONTROL JOINTS: SIDEWALK REINFORCEMENT SHALL NOT CONTINUE THROUGH CONSTRUCTION JOINTS, AT CONTROL JOINTS, CUT REINFORCEMENT WIRES.
16. PRIOR TO INITIATION OF CONCRETE FLATWORK, SUBMIT PROPOSED CONSTRUCTION JOINT PLAN TO THE ENGINEER FOR REVIEW AND APPROVAL. COORDINATE SUCH PLAN WITH THE JOINT PATTERNS DEPICTED ON THE DRAWINGS.
17. UNLESS OTHERWISE SPECIFIED, MISCELLANEOUS CONCRETE PADS SHALL BE CONSTRUCTED PER SIDEWALK DETAIL.
18. ALL NON-ACCESSIBLE STANDARD PARKING SPACES ARE 9.0' X 18'. ALL NON-ACCESSIBLE COMPACT PARKING SPACES ARE 8' X 16'. VERIFY OVERALL LAYOUT DIMENSIONS BASED ON THESE DIMENSIONS AND THE NUMBER OF SPACES INDICATED. FIELD-ADJUST OVERALL LAYOUT DIMENSION IN CONSULTATION WITH THE ENGINEER IF REQUIRED.
19. DIMENSIONS INDICATED ARE TO FACE OF CURB, PAVEMENT EDGE, EDGE OR CENTERLINE OF IMPROVEMENT, OR AS OTHERWISE NOTED.
20. ENGAGE A MASSACHUSETTS-LICENSED PROFESSIONAL LAND SURVEYOR TO PERFORM LAND SURVEYING SERVICES REQUIRED, INCLUDING, BUT NOT LIMITED TO VERIFICATION AND LAYOUT OF BASELINES, PROPOSED IMPROVEMENTS, DIMENSIONS AND ELEVATIONS. REPORT DISCREPANCIES TO THE ENGINEER.
21. PROVIDE FOR THE LAYOUT AND STAKING/MARKING OF THE PROPOSED LOCATION OF ALL PROPOSED SITE IMPROVEMENTS, INCLUDING FURNISHINGS. OBTAIN ENGINEER'S APPROVAL OF THE LAYOUT PRIOR TO PROCEEDING WITH THE WORK.
22. UNLESS OTHERWISE INDICATED, LINES ARE PARALLEL OR PERPENDICULAR TO LINE FROM WHICH THEY ARE MEASURED.



TEC
The Engineering Corp

Recommendations
6/5/2018

DOMINIC RINALDI, PE — No. 40074

WOODLAND COVE

3102 CRANBERRY HIGHWAY
IN
WAREHAM
MASSACHUSETTS

OVERALL LAYOUT AND MATERIALS PLAN

JANUARY 12, 2018

REVISIONS

PREPARED FOR:
DAKOTA PARTNERS
1264 MAIN STREET
WALTHAM, MA 02451

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127 617 896 4300

SCALE: 1" = 50'

FILE: 8366900-LM.DWG

DWG. NO: C-2.0

JOB. NO: 83066.00

WOODLAND COVE - JANUARY 12, 2018

ZBA

May 11, 2018

VIA EMAIL zba@wareham.ma.us

Zoning Board of Appeals
Town of Wareham
54 Marion Road, #3
Wareham, MA 02571

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Dear Zoning Board of Appeals,

We, the undersigned, residents of Wareham, respectfully present the following concerns for your consideration, regarding the proposed 40B development at the corner of Cranberry Highway and Red Brook Road.

This area was originally built as a vacation area and the **infrastructure** was constructed based on a seasonal use and demand of Wareham's resources. Over the years it has developed into primarily year round homeowners, although there are still some seasonal owners.

We are concerned about the increased strain on our town's resources including **water, sewer capacity, emergency services,** and **schools**.

We are also concerned that **storm water run-off and flooding** may be an issue once the proposed area is developed and blacktopped.

In addition, we are concerned about an **increased tax burden**. Many residents are older and on fixed incomes. This is a modest community and we were attracted to it for that reason. Increased taxes may tax us out of our own homes.

Finally, our most immediate concern is the **significant increase in traffic and the associated safety issues**.

In addition to the proposed 40B development, Mass DOT is moving forward with their project down Cranberry Highway that will end 900 feet east past the entrance into Red Brook Road. The project includes a traffic light being installed at the intersection. The Mass DOT project studies were conducted without consideration of the impact of a 40B development project at that same intersection. The results of the study may have been significantly different with the 40B consideration.

The developers of the 40B are depending on the Mass DOT project to alleviate several issues that the 40B development project causes. The traffic study conducted for the 40B developers indicates that the intersection of Cranberry Highway and Red Brook Road was identified as a high crash location under the Federal Highway Association in 2012-2014 with over 2X the average number of accidents. The study is 4 years old and traffic has

increased significantly since then. The 40B developers claim that the signal that will be installed as part of the Mass DOT project will solve that problem. The 40B developers are depending on a third party completing a project that has not only been delayed several times for several years, but was prepared WITHOUT the consideration of the proposed 40B development. We are concerned with what will happen if the DOT project gets delayed or changed again, as well as the impact of the development on the DOT project.

The traffic impact study, to our knowledge, did NOT include Red Brook Road other than at the point of intersection with Cranberry Highway. The natural flow of traffic will be significantly interrupted and severe backups will occur on Cranberry Highway AND on Red Brook Road.

Cranberry Highway and Red Brook Road are the two main roads, and busiest, leading on cape other than the highways that lead directly to the bridges. The proposed development would be located where they intersect. It just doesn't make sense.

To avoid the traffic light backups from east to west on Cranberry Highway and possibly coming from Red Brook and trying to get to Cranberry Highway, folks will be cutting through the Indian Mound neighborhood and the Indian Heights neighborhood. Several of the roads barely accommodate one car. This was a summer vacation spot and there are heavily congested areas with homes very close to each other on paved dirt roads with very little frontage and no sidewalks. People walk their dogs and kids ride their bikes and scooters on these streets. We believe our ability to enjoy our neighborhood and our safety will be at significant risk because of the increased traffic if this 40B development moves forward as proposed.

In addition, there will be one entrance/exit into the 40B development onto Cranberry Highway and one onto Red Brook Road, right across from the two entrances and exits into the 7-eleven. So there will be at least two travel lanes on Red Brook Road, maybe 3 if there's a left turn lane, the entrance/exit from the 40B and the two entrances/exits from 7-eleven, 6 possible points of traffic flow into one congested area right before the traffic light. And that doesn't include people walking and/or riding bikes to 7-eleven. The proposed development and the significant increase in pedestrian as well as automobile traffic will significantly increase safety risks should it be allowed to move forward as proposed.

For all of the reasons stated above we respectfully request the Zoning Board of Appeals deny the comprehensive permit requested by the 40B Woodland Cove Development proposed by Dakota Partners, Inc.

Thank you.

Cc: Board of Selectmen (selectmen@wareham.ma.us)
Susan Gifford (susan.gifford@mahouse.gov)
Marc Pacheco (marc.pacheco@masenate.gov)

Petition against Woodland Cove:
housing project of 174 1, 2, and 3 bedroom units, at the corner of Red Brook and Cranberry Highway
RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Imelda Chestnut 10 Nokomis Rd Buzzards Bay
NAME and ADDRESS

David Jassat 7 Nockomis Rd Buzz. Bay
NAME and ADDRESS

[illegible] 9 Nokomis Rd BB
NAME and ADDRESS

Mike Russell - signed online Petition Nokomis Rd
NAME and ADDRESS

Mary Sims 3 Salt Works Rd Buzz. Bay
NAME and ADDRESS

JOSEPH SIMS
Joseph Sims 3 Salt Works Rd B.B.
NAME and ADDRESS

Audrey Peka 16 Saltworks Rd. B.B.
NAME and ADDRESS

John Strickland 20 Saltworks Rd. Buzzards Bay
NAME and ADDRESS

[illegible] 2 Hiawatha Rd. Buzzards Bay
NAME and ADDRESS

Beverly Johnson 142 Choctaw Dr, Buzzards Bay Ma
NAME and ADDRESS

Mary Davidio 57 Kimberly Ct. Wareham, MA.
NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

JEAN C. WHALEN 11 GITCHE GUMEE RD
NAME and ADDRESS

WILLIAM F HAWKINS 21 Gitche Gumee Rd
NAME and ADDRESS

JOHN VASCONCELLOS 14 GITCHE GUMEE RD
NAME and ADDRESS

Joseph M. Cox 23 Gitchee Gumee Rd.
NAME and ADDRESS

Gary Adams JR 35 Gitchee-Gumee Rd.
NAME and ADDRESS

GARY R Adams Sr 35 Gitchee Gumee Rd.
NAME and ADDRESS

Michael Connolly 38 GITCHE GUMEE RD
NAME and ADDRESS

Jamielly Connolly 38 Gitche Gumee Rd
NAME and ADDRESS

Adrien Trudeau 40 Gitche Gumee Rd
NAME and ADDRESS

FRANK FRASER 30 GITCHE GUMMEE Rd
NAME and ADDRESS

Jeannette Littlefield 22 Wychmas Ave
NAME and ADDRESS

Loren Littlefield 22 Wychmas Ave.

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Mary P Cawiff MARY P. CAWIFF 20 Wychonas Ave
NAME and ADDRESS

Joseph Mulkern Joseph Mulkern 20 Wychonas Ave.
NAME and ADDRESS

Maureen A Leahy MAUREEN LEAHY 33 Wychonas Ave.
NAME and ADDRESS

Ann M. Ezepik Ann M. Ezepik 33 Wychonas Ave.
NAME and ADDRESS

Karen J. Clawson Karen J. Clawson 21 Hiawatha Rd.
NAME and ADDRESS

John S. Clawson John S. Clawson 21 Hiawatha Rd.
NAME and ADDRESS

Margaret Devine margaret devine 46 wychonas ave.
NAME and ADDRESS

John Vacca John Vacca 46 Wychonas ave.
NAME and ADDRESS

Cheryl Martin-Sorienthd Cheryl Martin-Sorienthd 14 Wychonas Ave
NAME and ADDRESS

Martha Martin Martha Martin 18 Wychonas Ave
NAME and ADDRESS

Peter D Henley Marilyn Henley 37 WYCHONAS AVE
NAME and ADDRESS

PETER D HENLEY MARILYN HENLEY 37 WYCHONAS AVE

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Marie Whitcomb Marie Whitcomb 10 Chippewa Dr
NAME and ADDRESS

Michelle Lemmo 40 Wychmere
NAME and ADDRESS
Tim Bolton

[redacted] 64 Saltworks Rd
NAME and ADDRESS
Carol McEachron

Carol McEachron 46 Salt Works Rd
NAME and ADDRESS

Joan Allen 14 Wenonah Rd
NAME and ADDRESS
Sue Lacasse
64 Saltworks Rd

Susan Lacasse
NAME and ADDRESS

Heidi Walker HEIDI WALKER 14 and 12 HIAWATHA ROAD
NAME and ADDRESS

Wendy Doblanica WENDY DOBLANICA 14 and 12 HIAWATHA RD
NAME and ADDRESS

Paula D'Vician Paula D. Vician 12+14 Hiawatha Rd
NAME and ADDRESS

Royal B. Vician Royal B. Vician 12+14 Hiawatha Rd.
NAME and ADDRESS

Elaine M. Theodore ELAINE M. THEODORE 16 WENONAH RD
NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Mary deVarennes MARY deVARENNES 7 HIAWATHA RD
NAME and ADDRESS

Jane M Orr 2 Hiawatha Rd.
NAME and ADDRESS

Richard J Shurtleff 6 Hiawatha Rd
NAME and ADDRESS

Sean Mulhall Sean Mulhall 4 Wenonah Rd
NAME and ADDRESS

Stephen Dewar Stephen Dewar 8 Wenonah Rd
NAME and ADDRESS

Erika Dewar Erika Dewar 8 Wenonah
NAME and ADDRESS

Frank Malinofski 37 Wenonah
NAME and ADDRESS

Eliane Malinofski 37 Wenonah
NAME and ADDRESS

Harriet Sanchez 10 Hiawatha
NAME and ADDRESS

Frank Sanchez 10 Hiawatha
NAME and ADDRESS

Bethany Farrar 19 Wenonah Rd.
NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Joan Bebar 83 Red Brook Rd. Buzzards Bay Ma 02532
NAME and ADDRESS

Sally Jane Whipple 33 Monack Rd Wareham MA
NAME and ADDRESS

Debra P. Sta 41 Monack Rd. Wareham Ma
NAME and ADDRESS

Jennifer Cernuda 13 Monack Rd 02532
NAME and ADDRESS

ashley Dunn 10 monack RD 02532
NAME and ADDRESS

Jason Bray 22 Monack Rd 02532
NAME and ADDRESS

Tom Lambert 41 monack Rd 02532
NAME and ADDRESS

Kim VanFleet 16 Monack Rd. 02532
NAME and ADDRESS

Sara Berdy 22 Monack Rd 02532
NAME and ADDRESS

Karen Dunn 10 Monack Rd 02532
NAME and ADDRESS

Patrick Connell 13 Monack Rd 02532
NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Greg Smith 30 Algonquin St
NAME and ADDRESS

Luann Smith 30 Algonquin St.
NAME and ADDRESS

[illegible] 103 Swifts Beach Rd
NAME and ADDRESS

Kimberly Jensen 43 Depot Street
NAME and ADDRESS

[illegible] 30 Algonquin S.T
NAME and ADDRESS

[illegible] 77 redbrook rd
NAME and ADDRESS

[illegible] 77 Red Brook Road
NAME and ADDRESS

[illegible] 43 Wenonah Rd
NAME and ADDRESS

Jim Patricelli 35 Wenonah Rd JPSLIM6707@COMCAST.NET
NAME and ADDRESS

DENISE FERNANDES 44 WENONAH RD

NAME and ADDRESS

[illegible] 70 WENONAH RD
NAME and ADDRESS

Petition against Woodland Cove:
housing project of 174 1, 2, and 3 bedroom units, at the corner of Red Brook and Cranberry Highway
RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Debra Miglino 14 Arrowhead Wareham Ma
NAME and ADDRESS

Bruce Collotta 17 Arrowhead Wareham
NAME and ADDRESS

Ted Larkin 22 Fearing St. Wareham
NAME and ADDRESS

DAVID A SOUZA. 36 BUTLER ST WAREHAM
NAME and ADDRESS

Charles Stewart 55 Butler St Wareham
NAME and ADDRESS

JOSEPH CARDOZA 10 arrowhead Wareham
NAME and ADDRESS

Jon Miller 23 arrowhead dr
NAME and ADDRESS

Krista Crawford 3132 Cranberry Hwy #58 E. Wareham
NAME and ADDRESS

[illegible] 4 MARITIME DR Wareham
NAME and ADDRESS

[illegible] 20 Npose Lane E. Wareham Ma 02538
NAME and ADDRESS

NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Virginia Wadsworth 40 Wenonah Rd
NAME and ADDRESS

Jan McComack 73 Fearing Hill Rd
NAME and ADDRESS

Linda Dutton 26 Cross Road
NAME and ADDRESS

Daniel Mullins 61 Hunter Ave.
NAME and ADDRESS

Teresa M. Todd 2 White Pine Ave
NAME and ADDRESS

Paul C. Mullins 61 Hunter Ave.
NAME and ADDRESS

Donna Kinsman 17 Great Ave
NAME and ADDRESS

Brenda Conboy 53 Main St. 215
NAME and ADDRESS

Robert Smith 144 High St 2
NAME and ADDRESS

Laurina Hansen Bramley Hill
NAME and ADDRESS

NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Pauline Ogden 4 Martin St Buzzards Bay
NAME and ADDRESS

Pat [illegible] 4 Martin St Buzzards Bay
NAME and ADDRESS

William Hansen 4 martin st Buzzards bay
NAME and ADDRESS

Karen Malloy 66 Marion Street Buzzards Bay MA
NAME and ADDRESS

Lucille Dodson 58 Fearing ST Buzzards Bay, Ma.
NAME and ADDRESS

Jeremy Dodson 76 Fearing ST Wachan, Ma
NAME and ADDRESS

David Forbes 88 Choctaw DR Buzzards Bay
NAME and ADDRESS

Wendy Forbes 88 Choctaw Dr. B.Bay
NAME and ADDRESS

William Oaks 11 Nokomis Rd. B. Bay
NAME and ADDRESS

Kim Oaks 11 Nokomis Rd. Buzz. Bay
NAME and ADDRESS

Imelda [illegible] 10 Nokomis Rd Buzz Bay
NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

* Marie Strawn 42 Highland Ave. Onset MA
NAME and ADDRESS

EDWARD RANSOM 15 CHIPPEWA Drive WAREHAM
NAME and ADDRESS

REBECCA BRITT 15 CHIPPEWA DRIVE WAREHAM
NAME and ADDRESS

Janet Kowzic 2 Shawne Drive Wareham
NAME and ADDRESS

* Laura C Dow 6 Union Ave Onset
NAME and ADDRESS

* Melissa Gaudet 26 Nanumett ST Onset
NAME and ADDRESS

* Ellen Cook 6 CW Bishop Ave Onset
NAME and ADDRESS

* William W Cook 6 CW Bishop Ave Onset
NAME and ADDRESS

Joanne Barboza 14 Atlantic Ave Wareham
NAME and ADDRESS

Rosemary Barboza 14 Atlantic Ave, Wareham
NAME and ADDRESS

Diane M. Distefano 6 Butler ST. Wareham 02532
NAME and ADDRESS

* Onset signatures because of concern for strain on Onset Fire Dept resources.

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Linda Jassel - 7 NoKomis Rd
NAME and ADDRESS

Michael Rosell - 8 NoKomis Rd
NAME and ADDRESS

Dawn Gallo - 11 NoKomis RD
NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

RE: PROPOSED 40B WOODLAND COVE DEVELOPMENT, WAREHAM, MA

Robert N Farr Jr. 19 Wenonah Rd.

NAME and ADDRESS

Delsore J Ransom 32 Wenonah Rd.

NAME and ADDRESS

Rob Ransom 32 Wenonah Rd

NAME and ADDRESS

Greg W Walsh 37 Mariads Rd

NAME and ADDRESS

Sandra Kraeger 23 Wenonah Rd.

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

NAME and ADDRESS

Re: Concerns Regarding Woodland Cove 40B Project

Mary Sims <marsims56@yahoo.com>

Wed 5/9/2018 10:34 AM

To:Jasmin Campos <JCampos@wareham.ma.us>;

Ms. Campos:

My husband and I own a home on 3 Salt Works Rd., Wareham, MA 02532. The deed is in the name of Joseph C. Sims and Mary Sims.

We are very concerned about the 40B project at the corner of Cranberry Hwy. and Red Brook Road. There is a traffic concern on both roads and water run off from the extra living quarters, and sewage as a whole. Also, Indian Hights Beach is a private, association beach. We would not want to have to monitor our beach to make sure that only members are using it. It is a very small beach and could easily get over crowed if not monitored in some way. Also, many extra cars would be using our narrow streets as a cut through to the complex.

We sincerely hope the board will drastically trim down the amount of apartments that will be allowed to be built at that site. Maybe some type of small retail could be considered in lieu of apartments.

Sincerely,

Joseph and Mary Sims

From: Jasmin Campos <JCampos@wareham.ma.us>
To: "marsims56@yahoo.com" <marsims56@yahoo.com>
Sent: Wednesday, May 9, 2018 10:25 AM
Subject: Concerns Regarding Woodland Cove 40B Project

Mrs. Sims,

Thank you for calling me today to address your concerns with the Woodland Cove 40B project being proposed off of Cranberry Highway. If you could please express those concerns in writing so that they may be read into the record at tonight's hearing I would greatly appreciate it. Thank you!

Jasmin Campos
Assistant to the Planning Department
Town of Wareham
508-291-3100 x6500

May 9, 2018

The Wareham Board of Selectmen &

The Honorable Susan Gifford
191 Main St. # 213F
Wareham, MA 02571

Dear Selectmen and Representative Gifford,

I am writing to encourage your careful actions regarding the proposed Woodland Cove complex slated for construction in our town.

I, and many neighbors in the area adjacent to this site are vehemently opposed to this project for a litany of reasons. Strain on town services; schools, EMS, DPW and paramount – water and sewer strain. This site is also dangerously close to the Red Brook Well fields.

Traffic issues will be severe as the DOT plans for the highway were done prior to this development and did not take it into account. Further, the traffic studies paid for by the developer assume the DOT project will help mitigate the problem. Drivers trying to avoid the area will cut through our residential neighborhood, already notorious for its substandard roads. Adding danger for the children present and further damaging the roads, many of which are one lane wide.

While it seems an inevitable development, I plead with you to lessen the impact of this poorly planned boondoggle who's only benefit is to enrich the pockets of another absentee landlord and further reduce our Town's standing as a good place to live. Wareham clearly does not need more affordable housing. If our representative in the House, Mr. Pacheco, would support mobile home parks as affordable, we'd probably be over the 10% goal.

Please do what's right for Wareham and do everything in your power to see this project eliminated or greatly reduced.

Respectfully,

Michael Russell
8 Nokomis Rd.
Wareham, MA 02571

Indian Heights Association

Sally Whipple
33 Monack Rd
Buzzards Bay, MA 02532

Town of Wareham
Zoning Board

May 8, 2018

Dear Members of the Wareham Zoning Board;

As a homeowner, taxpayer and voter, in the Indian Heights section of Wareham I am writing to you regarding the proposed 40B housing project at the corner of Red Brook Road and Cranberry Highway.
The proposed plan is to create 174 units of 1, 2, and 3 bedroom apartments.

This project will put considerable strain on our municipal services, including water, sewer, fire and school departments. Of particular concern is the increase in traffic that it will cause in an area that is already highly congested.

I strongly urge you to do anything and everything you can to thwart this project. If it cannot be stopped, then the number of proposed units must be drastically reduced.

Thank you for your time and concern in this matter.

Yours truly,

Sally Whipple

Sally Whipple

BSC GROUP

MEETING MINUTES

803 SUMMER STREET, BOSTON, MA 02127 - www.bscgroup.com
TEL 617-896-4300 - 800-288-8123

To:	James V. O'Brien, Dakota Partners, Inc.	**Date:**	May 7, 2018
From:	Dominic Rinaldi	**Proj. No.**	83669.00
Re:	Sewer Study Scope, Woodland Cove, Wareham, MA		
Date of Meeting:	May 4, 2018	**Time:**	8:00 AM
Place of Meeting:	Warehame Water Pollution Control Facility, 6 Tonys Lane, Wareham, MA		
Purpose:	To determine extent of sewer study to be performed during Comprehensive Permit process		
List of Attendees:	Guy Campinha, Wareham Russ Kleekamp, GHD Joseph Federico, BETA Group Christopher Cronin, BETA Group James O'Brien, Dakota Dominic Rinaldi, BSC Group		

Item	Discussion	Action
1	J. O'Brien (JO) provides overview of typical requests Dakota has seen in other communities where they've performed work – modest sewer review fee for town to add flows to existing model along with standard peer review of sewer design. Dakota does not deem it fair to pay $35k for Town to develop a model of their system from site to WWTP.	Info.
2	G. Campinha (GC) describes standard practice in Wareham – Town does not have existing model to plug info into and has required numerous larger projects in town to do the same type of modeling.	Info.
3	There was extensive discussion on the 40B process, what the courts have determined can be required of 40B applicants, and how costs for sewer system issues/upgrades required to accommodate 40B projects are spread through rate payers (including the new development) and amortized over time. GC explains that the Town does not have the ability to amortize improvement costs and, therefore, requires developers to fully fund these improvements at the time of development. GC does not make a distinction between 40B developments and "standard" permitting projects – only concern is protecting the sewer system.	Info.
4	The 18" main on Cranberry Highway that this development would tie into is a critical line in Town as it not only collects the commercial properties along Cranberry Highway, but a large portion of Bourne as well.	Info.
5	The WWTP sees dry weather flows of approximately 1 million gpd and wet weather flows of 5-6 million gpd, demonstrating extensive inflow & infiltration (I/I) issues of collection system. BETA Group (BETA) is currently performing a system-wide I/I study. The Town is planning $10 million investment this year to remove I/I.	Info.
6	In 2011 a WWTP capacity study was performed. Total project sewer flows are	Info.

Item	Discussion	Action
	approximately 34,760 gpd (316 bedrooms x 110 gpd/bedroom).	
7	A discussion of project's phasing ensued. GC, BETA, and GHD did not realize project would be in 3 phases over at least 3 years. This means only approximately 1/3 of total project flows will be seen each year.	Info.
8	Based on phasing, it may be possible to have a sewer impact fee paid by Dakota prior to building permit issuance that would be used to removed I/I from this sewer main to create the capacity required for each phase. Typical impact fees are around $5/gallon.	Info.
9	JO indicated that Dakota would be amenable to a sewer impact fee (see Item 8) being a condition of the Comprehensive Permit to remove I/I and fund the capacity study. JO also indicated that Dakota would be willing to pay for site review not to exceed $10,000.	Info.
10	GC agreed that a phases approach with sewer impact fees due prior to each phase is much more amenable to the Town along with a typical peer review by their consultant.	Info.
11	It was agreed that GC, BETA, and GHD would have further internal discussions to determine impact fees, upfront peer review fees, and other potential conditions they may require as part of the Comprehensive Permit and then make a recommendation to the ZBA. Next ZBA hearing is May 9, so it was agreed that a formal recommendation would likely not come until the following hearing (assumed to be May 23).	Sewer Dept. to provide conditional recommendations to ZBA (estimated prior to May 23 hearing)

cc: P. Freeman, Esq.
K. Buckland, Wareham

BSC GROUP
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May 7, 2018

Town of Wareham Zoning Board of Appeals
Memorial Town Hall
54 Marion Road
Wareham, MA 02571

RE: Response to Peer Review for Woodland Cove, Comprehensive Permit
3102 Cranberry Highway, Wareham, Massachusetts

Dear Chairman Elkallassi and Board of Appeals Members:

This letter provides information requested by Mr. Charles L. Rowley, PE, PLS, in his peer review letter dated April 23, 2018 regarding parking at the proposed Woodland Cove development in Wareham, Massachusetts.

The proposed Woodland Cove development will consist of 174 residential units, 32 one-bedroom units and 142 two-bedroom units. Per the Town of Wareham Zoning Bylaws (Zoning) Section 921, each 1-bedroom unit requires 1.5 parking spaces and each 2-bedroom unit requires 2 parking spaces. This results in a Zoning requirement of 332 parking spaces for the project or approximately 1.91 spaces per unit.

Based on similar, previous projects they have developed, Dakota Partners has found the required number of spaces to be 1.1 – 1.3 spaces per unit (see list of Dakota Partners properties parking submitted separately). Additionally, according to the Institute of Transportation Engineers (ITE), Parking Generation, 4th Edition, the average weekday parking demand in a Low/Midrise Apartment, Suburban location is 1.23 vehicles per dwelling unit. The Woodland Cove development includes 260 parking spaces, which is the equivalent of approximately 1.49 spaces per unit. This is higher than the parking demand anticipated by both the developer and ITE for this land use.

Sincerely,
BSC Group, Inc.

Dominic Rinaldi, P.E., LEED AP BD+C
Senior Project Manager / Senior Associate

cc: J. O'Brien, Dakota Partners, Inc.
P. Freeman, Esq., Freeman Law Group LLC

May 5, 2018

Stephen and Eryka Dewar
8 Wenonah rd
East Wareham, MA 02532

To: Town of Wareham
Zoning Board

We are writing this letter to express our concerns regarding the proposed Woodland Cove development on Redbrook Road. This project will impact the entire town and our neighborhood adversely.

The intersection of Redrook Road and Cranberry Highway is currently one of the most accident prone places in town. Cranberry Highway is scheduled to be worked on but the size of this development with the additional traffic will quickly overwhelm this intersection.

The additional students will cripple our school system which is already in financial crisis. We are forced to close one school and layoff an additional 30 staff. We will never be able to shoulder this additional burden.

Perhaps the most challenging of this project will be the added need to satisfy the water and sewer requirements. When troubles arise with these systems the developers from out of town will be exactly that...out of town. These people have no vested interest in the greater good of Wareham.

Perhaps the most important concern is the scale of the project. 174 Units with most having multiple bedrooms is totally out of character for this area. Ultimately it is the size of this proposal which creates all of the above concerns.

Please do everything you can to obstruct, delay, scale down or eliminate this proposal.

Thank You,

Stephen Dewar

Eryka Dewar

BETA
CELEBRATING 35 YEARS

RECORD OF MEETING

Date:	May 07, 2018	**Job No.:**	Project Number
Date of Mtg:	May 04, 2018	**City:**	Wareham, MA
Location of Mtg:	Wareham Water Pollution Control Facility	**Prepared By:**	Chris Cronin, P.E.
Mtg Topic:	Woodland Cove – 40B Development		

ATTENDEES:

NAME	ADDRESS / AFFILIATION	NAME	ADDRESS / AFFILIATION
Jim O'Brien	Dakota Partners	Guy Campinha	Wareham Water Pollution Control
Dominic Rinaldi	BSC Group	Joe Federico	BETA Group
		Chris Cronin	BETA Group
		Russ Kleekamp	GHD

"DRAFT" RECORD OF MEETING MINUTES:

Purpose of meeting was to discuss potential impacts from the proposed Woodland Cove – 40B Development. Wareham Water Pollution Control has requested that the Woodland Cove developer (Dakota Partners) complete an impact analysis on the collection system and waste water treatment facility to demonstrate that the existing systems had sufficient capacity to manage the additional flow.

Mr. O'Brien: Mr. Obrien indicated that it is not a typical request for the Town to require that the developer complete a detailed analysis of the Town's existing systems. It is more typical that a Town request a modest fee that will allow the Town to pay an engineer to input projected flows from a new facility into an existing model. Specific to 40-B projects, there is precedent set that the courts have supported to proceed in this manner.

Mr. Campinha: Mr. Campinha indicated that the Town does not currently have a model of their existing facilities. It is therefore critical that the developer conduct an evaluation of the impacts his development will have on the existing system. Recent flow conditions resulting from significant spring rain events have raised concern that the treatment facility and collection system may be reaching their capacity. The Town also has to consider flow allocation promises it has previously made to other entities.

Mr. Obrien: Mr. Obrien acknowledged the concerns and noted that an evaluation of the system should be the responsibility of the rate payers. It would be similar to capital improvements made within the system.

Mr. Campinha: Mr. Campinha noted that he has required numerous private developers in Town to complete impact analyses and in addition pay for and/or construct the necessary improvements within the system to accommodate the additional flow from their respective facilities. Whether it is upsizing an existing sewer pipe or increasing the pumping capacity at a sewage pumping station, the responsibility has been with the developer.

Mr. Obrien: Mr. Obrien asked if the Town had an existing model.

Mr. Campinha: Mr. Campinha indicated that the Town did not have a model and that is why the developer is being asked to evaluate the impacts of the projected flow from the proposed development.

Mr. Federico: Mr. Federico further stressed the point that recent flow to the wastewater treatment facility had raised concern that the existing infrastructure was at capacity.. He indicated that average daily flows to the wastewater treatment facility are generally about 1.0 MGD. Wet weather flows to the treatment facility can be as high as 8 MGD and the high flow conditions were recently the cause of an overflow of the facility's lagoons. MassDEP had to be notified of this occurrence.

Mr. Obrien: Mr. Obrien indicated that ZBA???? would not complete a study.

Mr. Campinha: Mr. Campinha indicated that he would need to tell ZBA?? that he cannot be expected to receive flow without an analysis

Mr. Obrien: Mr. Obrien indicated that a 40B cannot be expected to pay for a study that would benefit the entire Town.

Mr. Kleekamp: Mr. Kleekamp asked Mr. Obrien how the facility would be constructed and if there was a phasing plan, or would the entire facility be constructed at once with full occupancy anticipated.

Mr. Obrien: Plan is for a Phased Build-out over a four (4) year timeframe.

- Property currently has a "Purchase and Sales" Agreement for the entire site and its effective duration is 7 years
- The plan will be to buy the property in phases
- Plan to build 63 units/year

Requirements stipulated by the Town would be written into the decision. Mr. O'Brien requested that any payments required be assigned during the Construction phase of the project. Requirements may include:

- No greater than 7,300 gallons per day can be added in any given year

- Install equalization tank to temporarily store flow on site and meter into the system during off-peak hours
- Pay initial $10,000 for the Study
- Pay Infiltration and Inflow fee of $5/gal for each gallon of flow introduced into the system from the new development.

Meeting concluded with the understanding that the development would occur in phases over a four year period and requirements identified by the Town would be listed in the decision to purchase the property.

We believe this Record of Meeting accurately reflects what transpired at this meeting. Unless notified in writing to the contrary within ten (10) days after receipt, we will assume that all in attendance concur with the accuracy of this transcript.

May 3 (4 days ago)

Medeiros, Colleen

to me

Hi Jim –

I ran an ITE Trip Generation scenario for a 40 ksf office and 40 ksf retail center and together both uses would generate approximately 4,300 vehicle trips per day. Note some credit could be taken for shared trips between the two uses and also some retail traffic would be considered "pass-by" traffic.

The proposed Woodland Cove project would generate approximately 1,150 vehicle trips per day, so definitely less of an impact.

Note we can take credit for the existing motel trips which is 155 vehicle trips per day.

Hope this helps.

Thanks,

Colleen M. Medeiros, P.E., LEED AP
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