



# Town of Truro

P.O. Box 2030, Truro, MA 02666  
Tel: 508-349-7004 Fax: 508-349-5505

## ZONING BOARD OF APPEALS Agenda

**DATE OF MEETING:** Thursday, August 20, 2020  
**TIME OF MEETING:** 5:30 pm  
**LOCATION OF MEETING:** Remote Meeting  
[www.truro-ma.gov](http://www.truro-ma.gov)

### Open Meeting

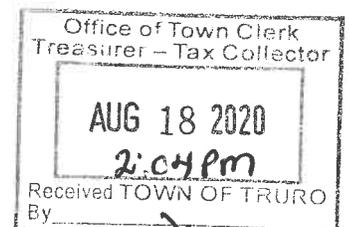
This will be a remote meeting. Citizens can view the meeting on Channel 18 in Truro and on the web on the "Truro TV Channel 18" button under "Helpful Links" on the homepage of the Town of Truro website ([www.truro-ma.gov](http://www.truro-ma.gov)). Click on the green "Watch" button in the upper right corner of the page. Please note that there may be a slight delay (approx. 15-30 seconds) between the meeting and the television broadcast/live stream.

Citizens can join the meeting to listen and provide public comment via the link below, which can also be found on the calendar of the Board's webpage along with the meeting Agenda and Packet, or by calling in toll free at 1-866-899-4679 and entering the following access code when prompted: 611-192-245. Citizens will be muted upon entering the meeting until the public comment portion of the hearing. If you are joining the meeting while watching the television broadcast/live stream, please lower the volume on your computer or television during public comment so that you may be heard clearly. Citizens may also provide written comment via postal mail or by emailing the Town Planner at [planner1@truro-ma.gov](mailto:planner1@truro-ma.gov).

Meeting link: [global.gotomeeting.com/join/611192245](https://global.gotomeeting.com/join/611192245)

Hearing materials can be found at the following web address:

[www.truro-ma.gov/zoning-board-of-appeals/pages/cloverleaf-40b-application](http://www.truro-ma.gov/zoning-board-of-appeals/pages/cloverleaf-40b-application)



**Review of Comments**

- Public Comment letter from Chuck Steinman
- Public Comment letter from Karen and Frederick Ruymann
- Public Comment letter from Claire and Mauro Aniello
- Public Comment letter from Julia Lester
- Public Comment letter from Pamela Fichtner
- Public Comment letter from Ron Fichtner
- Public Comment letter from Eve Turchinetz
- Public Comment letter from George Dineen
- Public Comment letter from Hank Keenan
- Public Comment letter from Pamela Wolff
- Public Comment letter from Stephen Williams

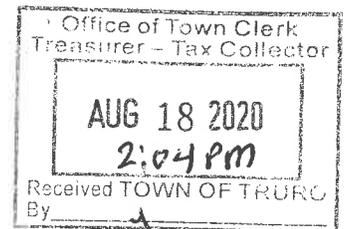
**Public Hearing – Continued**

**2019-008 ZBA – Community Housing Resource, Inc.** seeks approval for a Comprehensive Permit pursuant to G.L. c. 40B, §§20-23 to create 40 residential rental units, of which not less than 25% or 10 units shall be restricted as affordable for low or moderate income persons or families, to be constructed on property located at 22 Highland Road, as shown on Assessor’s Map 36 and Parcel 238-0 containing 3.91 acres of land area.

- Discussion of response by J.M. O’Reilly & Associates, Inc. to the Cloverleaf Project Second Peer Review by the Horsley Witten Group

**Public Comment**

**Adjourn**



**From:** c.e.steinman  
**Subject:** Additional Comments for the Public Record Regarding the Design of the Proposed Cloverleaf Proje  
**Date:** July 1, 2020 at 9:26 AM  
**To:** Jeffrey Ribeiro jribeiro@truro-ma.gov  
**Cc:** Art Hultin Fred Todd : John Thornley :



John R. Dundas

**Bcc:** Chuck Steinman

*Please read into the Public Record the following comments that are intended to make clear the points of my previously submitted comments:*

**The COVID pandemic has significant new implications for the health and safety for all Truro's residents, and in particular for future Cloverleaf residents.** Many institutions that are cautiously grappling with reopening are extremely concerned about their liability for the spread of Covid-19. Not only are they limiting occupancy levels and creating safer environments, they fear potential lawsuits for not meeting strict State regulations for providing protective measures, or new standards for cleaning and sanitation. The potential liability of the Town and the developer must be taken into account.

**The pre-pandemic design of the Building #21 congregate apartment is no longer an appropriate solution for Truro or its seniors.** Given the high percentage of deaths in congregate retirement communities and nursing facilities, redesign of the apartment building must be taken seriously. In my comments in the June 25 packet and as further supported by the following excerpts from New York Times (*Coronavirus Crisis Threatens Push for Denser Housing*, by Kevin Williams, May 6, 2020), it is recommended that Building #21 be replaced with a 9 or 12 townhouse units similar to those previously proposed for the site, of which 6 or 8 could be accessible ground-floor units entered from the front and back. Pertinent to the recommended Cloverleaf redesign are the following excerpts from the NYT article:

**"The whole discussion about housing will change.** A lot of the bills and laws the Legislature have been discussing will be **looked at in a different lens,**" [Isaiah Madison, a board member of Livable California, a nonprofit group] said.

"I wouldn't make any big development decisions right now," said Dr. Jackson, a former officer in the Epidemic Intelligence Service at the Centers for Disease Control and Prevention. "The economic fallout is likely to last five years or more," he added, "and people may be wearing masks for several years. **Developers will have to factor the pandemic, and other crises, into their plans.**"

"The desire for denser developments might diminish," [Mr. Youngentob, a Maryland developer] said, and his company may switch its focus to townhomes. **"The forced interaction of sharing doors and elevators has caused some anxiety,"** Mr. Youngentob said, **"Townhomes, where you come in and out of your door, and you know you are the only one touching your door handle, provide some comfort."** (Emphasis added.)

**Responsibility for the apartment building's daily cleaning and maintenance of commons areas, shared laundry rooms, elevators, stairwells, etc. will be an unanticipated burden and expense.** As noted above, people are now fearful of occupying such spaces and are likely to prefer the privacy associated with duplexes or townhouses. The Town's responsibility for protecting its residents' health and safety has taken on a whole new dimension. Now is the time for the ZBA to press **"PAUSE"** to allow enough time for these concerns to be properly evaluated.

## **Accessible Entry Recommendations**

I would like to document my comments at the July 30, 2020 ZBA Cloverleaf Public Hearing regarding the entry steps to the units with photos of examples from the Edgewood Farm Project.

As recommended by the Commission on Disabilities, the developer should consider the replacement of entry steps to the Cloverleaf units with landscape-integrated walkways such as in the photos of the remodeling of Edgewood Farm by the Truro Center for the Arts at Castle Hill. A make-shift plywood ramp as offered by the developer is unsafe, unsightly, and could be slippery when wet.

Integrated landscape and walkway design can eliminate the need for steps.



The first two photos show the entry to the offices with a walkway that uses landscaping and a planting bed to create an entry without steps leading directly into the building at the interior floor level.



The third photo shows a subtle ramp leading to a landing at the interior floor level, and a step from that to the lawn for those who are able to use it.

## Elizabeth Sturdy

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**From:** Ruymann  
**Sent:** Thursday, August 13, 2020 2:14 PM  
**To:** BHugginsCarboni@k-plaw.com; Town Planner; TruroZoningBoardofAppeals@aol.com  
**Cc:** Elizabeth Sturdy  
**Subject:** Pond Villagers Placed on ZBA Agenda | Cloverleaf Hearings

Dear Colleagues,

When Truro Town Meeting approved buying the Cloverleaf parcel in 2016 for affordable housing, we understood that the intent was to build 12-16 units. This was clearly the voters' understanding and intent, since the Select Board comments to the article, upon which Truro voters could and did explicitly rely, stated this goal. We assumed that number would go forward, because it is what our Zoning Bylaws allow for affordable housing and what our Board of Health regulations allow as a safe number for the 3.9 acre property, namely up to 17 bedrooms. We are still fully behind this Town Meeting approval of up to 16 units on this property.

However, as we have learned that the Truro Zoning Board of Appeals is actually considering an application for 39 units/70 bedrooms on that land, so close to Pond Village, alarm bells that were quietly ringing in the background are now loudly peeling for our community. The more we have learned of this proposal, the bylaw and health regulation waivers it requires, and the dangers of water contamination, the more concerns we began to have, primarily about the potential impact on the drinking water in our neighborhood and the threat that might pose to our health and safety, not to mention our home equity.

At this time, Pond Village property owners are conferring with one another, moving to get our well-water tested, deepening our understanding of nitrogen/nitrates and other contaminants in drinking water and its consequences for health, and trying to understand why many experts say even levels as low as 1 ppm are a health threat in drinking water. We are trying to understand why the Cape Cod Commission recommends no more than 5ppm, and the EPA accepts a standard of 10ppm, while also saying that it doesn't apply to private wells for which the risks seem greater.

We are not convinced that the ZBA has yet devoted sufficient attention to the health and safety of Pond Village and other nearby residents. Before the Board starts actually deliberating on the many requested waivers, we request that Pond Village be listed as an agenda item for a scheduled meeting so that we can be represented directly before the Board, rather than as a Public Comment at the end of the meeting. We support community housing developed in a manner that does not threaten our health and safety. We believe the Town can accomplish both and hope for the opportunity and time to be informed better and to inform the ZBA.

Please distribute this to the ZBA.

Thank you,  
Karen MacDonald Ruymann  
Frederick W. Ruymann

## Jeffrey Ribeiro

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**From:** Claire Aniello  
**Sent:** Thursday, August 13, 2020 4:26 PM  
**To:** BHugginsCarboni@k-plaw.com; Town Planner; Jeffrey Ribeiro  
**Cc:** Elizabeth Sturdy  
**Subject:** ZBA Agenda | Cloverleaf Hearings

Dear Colleagues,

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Thank you for your thoughtful attention,

Claire Aniello  
Mauro Aniello

## Jeffrey Ribeiro

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**From:** julia lester  
**Sent:** Thursday, August 13, 2020 5:39 PM  
**To:** Town Planner; Jeffrey Ribeiro  
**Cc:** EStudy@truro-ma.gov  
**Subject:** See below

SUBJECT: Pond Villagers Placed on ZBA Agenda | Cloverleaf Hearings

Dear Colleagues,

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Please distribute this to the ZBA.

Thank you,  
Julia Lester

## Elizabeth Sturdy

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**From:** Pamela Fichtner  
**Sent:** Friday, August 14, 2020 3:36 PM  
**To:** BHugginsCarboni@k-plaw.com; Town Planner  
**Cc:** Elizabeth Sturdy  
**Subject:** Pond Villagers Placed on ZBA Agenda | Cloverleaf Hearings

Dear Colleagues,

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Please distribute this to the ZBA.

Thank you,

Pamela Fichtner

## Elizabeth Sturdy

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**From:**  
**Sent:** Sunday, August 16, 2020 6:30 PM  
**To:** BHugginsCarboni@k-plaw.com; Town Planner  
**Cc:** Elizabeth Sturdy  
**Subject:** Cloverleaf Public Comment  
**Attachments:** ZBA\_RFichtner 8\_16\_20.docx

Dear Ms. Carboni and Ms. Sturdy,

Please include the attached letter in the packet for the August 20, 2020 Truro Zoning Board of Appeals meeting. Because of its perspective I will join the meeting to elaborate.

Thank you,

Ron Fichtner

August 16, 2020

To: Members, Truro Zoning Board of Appeals:

I am submitting this to the ZBA because I believe the Town of Truro can and should do better. It has the opportunity to create a model for affordable housing on Cape Cod. It should seize it.

Those desiring to live and work in Truro are attracted for the same reasons those of us who love Truro are: its open spaces, proximity to nature and the sea, picturesque views, and unique history.

Through research, we have become aware of the need to build and support communities that promote mental and physical health. We have come to understand the critical role of housing in addressing our nation's greatest public health concerns. They include obesity, cardiovascular disease, diabetes, asthma, injury, violence, social inequities, and depression. Alarming, the ongoing COVID-19 pandemic underscores these concerns.

We also know that the greatest burden of these diseases falls upon those with lower incomes, minorities, the elderly and those with disabilities. It is precisely those in these categories who are intended to benefit mostly from new affordable housing construction in Truro, and its availability.

Truro's answer to its need for housing, in addition that it be affordable and available, should also meet the critical criterion of promoting and sustaining public health to the greatest degree possible.

How is this best done? By building an environment that encourages physical movement, has ready access to green space, facilitates and invites social interactions and a sense of community, has walking paths, is away from road noise, is isolated from fumes and particulate matter from vehicles, has a nearby school, and is diverse in its inhabitants.

The intention of this public comment is not to be specifically critical of the Cloverleaf proposal, but instead to advocate for giving the Walsh property Truro's most immediate priority for affordable housing because of its superior potential. It does that by optimizing contributions to public health, rather than risking it, while allowing for the design of a planned community

that will attract new Truro residents wishing to make homes here, and is scalable when additional units are needed.

In marked contrast, development on the Walsh property would not require waivers from many long-established safeguards. It would also be free of the uncertain environmental and legal impacts facing the Cloverleaf proposal, including long-term potential fallout on well-water quality and property values in the areas of the effluent wastewater plume from the Cloverleaf development.

Transferring development of affordable housing to the Walsh property puts Truro farther along on the path to being a sustainable community by developing an environment that could serve as a model for affordable housing on the Cape. I am aware that shifting gears at this juncture may be a difficult challenge to leadership, but I am reminded of the adage, "A stitch in time saves nine."

Members of my family have been continuous residents of Truro since 1907. My career has been devoted to public health, and for much of three decades, I served as an epidemiologist and mathematician in leadership positions at the U.S. Centers for Disease Control and Prevention.

Three relevant references from the scientific literature are listed below.

Thank you for this opportunity to provide comment.

Ron Fichtner, Ph.D.

Perdue WC, Stone LA, Gostin LO. The built environment and its relationship to the public's health: the legal framework. *Am J Public Health*. 2003;93(9):1390-1394. doi:10.2105/ajph.93.9.1390

Jackson RJ. The impact of the built environment on health: an emerging field. *Am J Public Health*. 2003;93(9):1382-1384. doi:10.2105/ajph.93.9.1382

Williams DR, Mohammed SA, Leavell J, Collins C. Race, socioeconomic status, and health: complexities, ongoing challenges, and research opportunities. *Ann N Y Acad Sci*. 2010;1186:69-101. doi:10.1111/j.1749-6632.2009.05339.x

## Elizabeth Sturdy

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**From:** Eve Turchinetz  
**Sent:** Sunday, August 16, 2020 9:28 PM  
**To:** Town Planner; Elizabeth Sturdy  
**Subject:** Add the Cloverleaf for Pond Villagers to ZBA Agenda on August 20

To the Truro Planning Department:

SUBJECT: Pond Villagers Placed on ZBA Agenda | Cloverleaf Hearings

Dear Colleagues,

When Truro Town Meeting approved buying the Cloverleaf parcel in 2016 for affordable housing, we understood that the intent was to build 12-16 units. This was clearly the voters' understanding and intent, since the Select Board comments to the article, upon which Truro voters could and did explicitly rely, stated this goal. We assumed that number would go forward, because it is what our Zoning Bylaws allow for affordable housing and what our Board of Health regulations allow as a safe number for the 3.9 acre property, namely up to 17 bedrooms. We are still fully behind this Town Meeting approval of up to 16 units on this property.

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Please distribute this to the ZBA.

Thank you,

Mimi Turchinetz

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*Mimi Turchinetz, Esq  
Boston, Massachusetts*

*Listen, if you can stand to.*

*Union with the Friend means not being who you've been,  
being instead silence: A place: A view  
where language is inside seeing.*

*Rumi Persia (Afghanistan)*

## Elizabeth Sturdy

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**From:** George Dineen/ New England Project Contracting <nepcworks@gmail.com>  
**Sent:** Sunday, August 16, 2020 9:41 PM  
**To:** BHugginsCarboni@k-plaw.com; Town Planner  
**Cc:** Elizabeth Sturdy; nepcworks  
**Subject:** SUBJECT: Pond Villagers Placed on ZBA Agenda | Cloverleaf Hearings

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Please distribute this to the ZBA.

Thank you,

George Dineen

## Jeffrey Ribeiro

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**From:** Hank Keenan  
**Sent:** Saturday, August 15, 2020 3:43 PM  
**To:** BHugginsCarboni@k-plaw.com; BHugginsCarboni@k-plaw.com; Town Planner; Town Planner; Jeffrey Ribeiro  
**Subject:** Cloverleaf concerns

----- Forwarded Message -----

**From:** Hank Keenan  
**To:**  
**Sent:** Saturday, August 15, 2020, 12:47:01 PM EDT  
**Subject:**

Dear Colleagues,

When Truro Town Meeting approved buying the Cloverleaf parcel in 2016 for affordable housing, we understood that the intent was to build 12-16 units. This was clearly the voters' understanding and intent, since the Select Board comments to the article, upon which Truro voters could and did explicitly rely, stated this goal. We assumed that number would go forward, because it is what our Zoning Bylaws allow for affordable housing and what our Board of Health regulations allow as a safe number for the 3.9 acre property, namely up to 17 bedrooms. We are still fully behind this Town Meeting approval of up to 16 units on this property.

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Please distribute this to the ZBA.

Thank you,

Hank Keenan

## Elizabeth Sturdy

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**From:** Pamela Wolff  
**Sent:** Monday, August 17, 2020 4:04 PM  
**To:** Elizabeth Sturdy  
**Subject:** Cloverleaf II / ZBA

Hello Liz,

Hope you are well! Please add the below to the packet for the ZBA meeting. I will also attend. Would you be so kind as to send me the link for the meeting when it is available? Thanks. Pamela

Good afternoon Commissioners,

My name is Pamela Wolff.

Since your July 30th meeting I have been told by a number of Truro residents that I'm wasting my time and yours trying to influence the decisions of the ZBA; that the Cloverleaf Plan is baked in, a done deal, and nothing I or any other citizen may have to offer will affect the outcome. I can only hope that is not true.

One of the most stunning statements made at the last meeting came up almost as an aside: That the playground which was part of the RFP has been dropped entirely from the current plan. When questioned, the developer offered that children could play in the very tiny back yards of the townhouses, or they could find their way to the public playground behind the town's Council on Aging building. I find this statement unacceptable. Which of the minuscule back yards will be devoted to the daily activities of perhaps dozens of kids? What facilities might be provided by the residents of that house? Swings, slides, a sandbox? Toilet access? What about the kids that might be living in the apartment building? Would they be welcomed into the back yards of the townhouses?

How will the town feel about a stream of moms daily pushing strollers along route 6 in the rain or cold...and back! Or perhaps the Town might be petitioned to provide a jitney service?

The incentive created by the funding for the municipal water system has allowed the developer to max out every square inch of turf at the cost of the livability of those who are squeezed into this development. Playgrounds are not an amenity for developments of this size. They are a necessity.

I have been a supporter of State Senator Julian Cyr since his first run for office. I think he has represented his constituents well. But I must take exception to his closing comments in the op-ed published in the Cape Cod Times and elsewhere.

He states that he sees no merit in any of the deeply concerning issues that have been brought forward by a wide range of citizens. That he rejects them wholesale out of hand as racist is irresponsible. His remarks are not worthy of the good man I have thought him to be.

Thank you

## 2<sup>nd</sup> letter to the ZBA from S. Williams

Jl-28-20

I had assumed that any responsible discussion about “affordable housing” would be confined to that single issue alone. Sadly, that is apparently no longer the case. Now, it has been insinuated (in a Jl-23-20 op-ed by State Senator Julian Cyr) that anyone who has the audacity to question *any* aspect of “**this particular version**” of affordable housing known as the “Cloverleaf Proposal” is, *per force*, a *racist!* Hogwash!

This gratuitous libel may have been motivated by the fact that a group of Truro residents had the effrontery to write a very civil and well reasoned letter questioning several design aspects of “**this particular version**” noting that its size and density are well beyond the scope of what had been originally presented. And, it should be noted that this modestly worded and well-reasoned critique was subsequently co-signed by more than 75 people who, this op-ed would now seem to assert, are *all* racists!

*Or, might it just be possible that they’re right?* And that the numerous and major design flaws of this “Cloverleaf Proposal” invalidate the size, and expense of “**THIS PARTICULAR VERSION**” of affordable housing?

I also wrote a highly critical letter in opposition... not to “affordable housing” in general *but to specific aspects* of “*this particular proposal.*” In the course of 8 pages I cited some of the many problems which I felt the ZBA should consider before approving this project à priori given that, *in my opinion*, “**this particular proposal**” falls *far short* of what we should expect and be trying to achieve here in Truro. And just because I believe *we can do something much better than* “**this particular version**” of affordable housing, does the lengthy list of my objections make me a racist as well?

*Stifling dissent is bad enough (... think of it as voter suppression...) but rejecting any efforts to improve this project out of hand is even worse!* We all know that racism is a problem on the Cape but it’s ludicrous and irresponsible to assert that building this enormous 39-unit 70-bedroom complex on this disproportionately tiny 3.9 acre parcel will solve it. So let’s agree to put the distraction of that desperate slander aside, **and giving everyone the benefit of the doubt**, let’s also stipulate that *everyone* who has an opinion about the “Cloverleaf Proposal” **IS in favor of “affordable housing” in one form or another.**

That, I think, is a much more reasonable starting point!

But the issues before the ZBA now are not just about “affordable housing” any more. The primary issues are all about density and quality... it’s about cost and extortion... and it’s about the major corruption of process that enables a **private developer** to grossly expand the originally agreed upon number of units to such an extent that a 1½ million dollar public water supply *must be built (but not at their expense, mind you!)* to make their “proposal” even marginally feasible.

**Some key issues which still need to be addressed include:**

- 1) **Unfunded Liability:** The developer of this proposal *is not a philanthropist*. He is not here to provide ‘*year-round employment*’ (*which we actually need even more than affordable housing!*) but only for the considerable *private profits* this project will generate. And please note that he can “sell” his corporate shares at any time and walk away from any liability lawsuits. **Can Truro do that? And who owns the land?**
- 2) **Exceeding Voter’s Approval:** In 2016, when the voters at the Truro Annual Town Meeting (ATM) agreed to accept the “Cloverleaf,” (Please note BofS “Comment” below Article 20) it was done with the clearly “*stated intention*” of creating between 12 to 16 units of affordable housing which were, and are, appropriate for the spatial limitations of this site. On 3.91 acres, Title V allows for 17 bedrooms. **Why not build on that model** which would not overwhelm the site and create so many other costly problems? Bigger, as in this specific case, is not necessarily better.
- 3) **The Major Problem:** with “**this particular proposal**” is that the proponents are now seeking ZBA approval to jam 50 lbs. of sugar into a 5 lb. Bag... in other words, exceeding the original concept with more than **23± additional units and more than 54± additional bedrooms** and actually expecting everyone to just “go along” ... because some people feel that after “god, motherhood and apple pie,” this huge complex of “affordable housing,” (even on this undersized 3.91 acre parcel), should be exempt from any criticism, any opposition, or even public discussion. **Why do proponents of this flawed project consider it such a holy crusade?**
- 4) **Who Will Benefit?:** The result of “*this expensive swindle*” is that the State and the Town are going to have to spend a lot of unnecessary funds, and tax-payer dollars, “*just so the developers can make their profit goal*”. So perhaps we should be asking: “**Exactly who is being subsidized here?**” And what exactly is the Town’s share in this project? **Are we expected to pay for the roadway as well as a still undisclosed share of its water main?** **Please tell us now before coming into a ATM to ask for funding!**

5) **Density & Bad Siting:** Another problem is that the density of 39 *units with 70 bedrooms* on a 3.91 acre site makes it unnecessarily congested for the as many as the 140 people who may end up living there and who, given their economics, are the least likely to protest... not to mention that such density is being inappropriately sited immediately adjacent and down-wind of the constant noise and the unhealthy stench of carbon monoxide exhaust fumes from a major 4-lane highway drifting over the site 24/365. Will any of the proponents of this project actually stand up and dare to say that such an afflicted site is an ideal setting for raising children? Or, are we actually just saying that this much is good enough... as in, you know, for the working-poor? As in: *"Let them eat cake?"*

6) **Septic Issues Ignored:** Another problem with such high-density at this site is that the septic effluent of 70 bedrooms requires a Title V septic design for 7700 gallons per day... (Yes, that's 2,810,500 gallons per year!) situated directly atop the very center of our fragile single-lens aquifer in the middle of North Truro. Yet no one seems interested in getting the Mass DEP to step in and offer *THEIR* assessment of what environmental damage might accrue over the long term from this river of... well, you know what flows downhill. *Why is there such a lack of curiosity about this?* Is the greed or size of **"this particular version"** of affordable housing SO important that Truro must gamble, and jeopardize, the very viability of our shared water supply? In my opinion, this is wholly irresponsible!

7) **Requests for Too Many Exceptions:** Aside from the fact that the **parking plan** for this complex of 39 units and 70 bedrooms, with its *"two-car-deep parking spaces"* does not meet *Zoning Bylaw requirements, (it is also inadequate, completely unworkable and should be rejected as such!)*... my previous criticism noted that this proposal also comes with numerous, but unwarranted requests for sideline variances, and the expectations of even more exceptions to our height-of-building regulations. **(See their Exhibit T).** *Variances, such as these, require an applicant to meet all 3 of these separate qualifications:* Lot shape; soil conditions & topography; and "hardship" financial or otherwise. As I pointed out in my 1<sup>st</sup> letter to the ZBA of Mr-12-20, the developers **DO NOT QUALIFY for even one such exception...** especially given that they've had more than ample time to make their design fit within the limitations of our local regulations and minimum standards... just like everyone else who lives in Truro. The ZBA might also note that **Chapter 40-B does not grant any immunity from such local standards (see Chapter 40-B Handbook pg. 1).** And, any case they might allege about their *"hardship"* is entirely and deliberately self-created! Their refusal to even try to comply with local standards reflects a

presumptuous and arrogant intransigence which, I believe, *the ZBA should reject out of hand!*

8) **The Drawbacks of the Cloverleaf Site:** *This site was originally intended to have 12 to 16 units. Title V allowances of 10,000 sf. of lot-area-per-bedroom shows the actual area of 3.91 acres (or 170,319 sf.) just allows for 17 bedrooms, *but at that density it would be a 'site-appropriate' proposal!* If the Town needs more affordable housing after that we should consider the "Walsh Property" just south of the school which does not have all the spatial limitations and potential hazards to public health that the "Cloverleaf" site presents **and would also NOT REQUIRE the public expenditure of a costly 1½ million dollar water system just so the developer can stuff the "Cloverleaf" 3.91 acre site with 23± more units and 54± more bedrooms than the original agreement envisioned... and which grossly exceeds Title V allowances!** Why are we being rushed into subsidizing such an unexamined expansion at this less than ideal site? Consider how many units could be built *for half that* 1.5 million dollars at the Walsh site. *So, why are we wasting that money on the Cloverleaf?**

9) In closing it is my hope that the ZBA will decide to **NOT APPROVE "this particular version"** of affordable housing, and that by the time another proposal can be developed it will include **"priority occupancy" FOR TRURO RESIDENTS rather than bringing even more people to Truro when what we really need here most is more work and year-round jobs for the people who already live here!** Try solving *that problem* or at least consider it... because in the long run, **70 more bedrooms will only exacerbate our problem of joblessness... and not solve it!** The Walsh site invites a staggered program for the on-going construction of affordable housing... in yearly increments of say 3 or 4 units a year where subsidies might actually address *the needs of Truro residents!* In a better location!

*'this particular version' of affordable housing is not in the public interest.'*

10) Finally, if I were seated on the ZBA, I would move to **approve the original concept of 12 to 16 units (w/ 17 bedrooms)**, give the developer 2 or 3 months to bring back plans for that number which **do not require 'sideline variances'**, nor exceptions to the 'height-of-building regulations', and which would also **not require** the expenditure of a 1½ million dollar water subsidy, *and which actually do meet basic Title V allowances...* and then I would ask for a second! A simple majority is all you need for this. And remember your primary responsibility is to Truro, not the developer!

Stephen Williams



# J.M. O'REILLY & ASSOCIATES, INC.

PROFESSIONAL ENGINEERING, LAND SURVEYING & ENVIRONMENTAL SERVICES

Site Development • Property Line • Subdivision • Sanitary • Land Court • Environmental Permitting

August 14, 2020

MEMORANDUM

JMO-8446A

FROM: J.M. O'REILLY & ASSOCIATES, INC.

John O'Reilly, P.E., P.L.S. 

RE: Second Peer Review, July 6<sup>th</sup> & 9<sup>th</sup>, 2020  
Cloverleaf Project

Responses to the second Peer review by Horsley-Witten are as follows:

Contingency Plan: If the system fails to meet the 10.0 ppm of total Nitrogen at discharge:

- Owner, manufacturer, design engineer and plant operator shall develop improvements, based on the issues as presented, make the necessary adjustments to the operation of the plant to maximize the treatment performance.
  - An example of the process if there is an exceedance of Effluent Limits - Once the sample is returned to the Operator showing an exceedance of the discharge:
    - BOH will be notified
    - Operator will re-sample effluent and obtain results within 48 hours.
    - If Limits are still not met, operator shall review with the BOH the recommended steps to be taken so as to bring the system within compliance.
    - Operator shall re-sample after 30 days of plant modification.
    - If sample is still exceeding the limits of effluent, operator shall consult with the manufacturer of the treatment process to see what additional steps need to be taken.
    - BOH shall be notified of the 30 day sample and recommendations of the manufacturer. Operator shall implement the recommendations of the manufacturer.
    - If upon adjustments the system is not achieving the 10 ppm of total Nitrogen, the owner shall present to the Board of Health proposed corrective actions to the treatment train so as to ensure the 10 ppm of total Nitrogen.

Groundwater Monitoring:

- The Plan Sheet 2 of 6 has been revised to incorporate two monitoring wells. The first well is located up-gradient with the second monitoring well, down gradient.
- Sampling shall be taken quarterly, once system is up and running, or as required by the BOH.

Page 4: Item #4 – Pipe sizes:

- Clean out detail is now provided on sheet 3 of 5.
- Pipe diameter notes have been adjusted.

Page 4: Item #5 – Setbacks:

- Drainage Facility #3: Leaching facility has been shown to be 25.5 feet away from the leaching facility.
- On Sheet 5 of 6, additional notes have been added to address the concerns of the setbacks from the drywells for the roof runoff and the foundation areas.

Page 4: Item #6 – Groundwater:

- We will update the distance to groundwater once soil testing is completed.
- Based on the groundwater study HW completed, we anticipate a groundwater separation of +40 feet

Page 5: Item #8 – Operation and Attendance:

- See Contingency Plan on page 1.

Page 5: Item #1 - Stormwater:

- A MA Stormwater Report has been prepared for the development. The report identifies the project is designed in compliance with the requirements of the Stormwater handbook, Vol 1 -3.

Page 5: Item #2 – Contributory Area:

- Contributory areas have been edited with the development of the Stormwater Report.

Page 5: Item #3 - Contributory Areas:

- See above.

Page 6: Item 4 – Roof Runoff:

- Attached are the calculations for the roof run off drywells for Building #21. The calculations are based on the 50 year storm.
  - Building #21 with a roof area of 5,900 sf, requires a storage of 985 sf or three 12'x6 drywells with a capacity of 1,120 cf.
  - Ratio of 5,900 sf for three drywells = 1,960 sf per drywell.
  - The smaller buildings are 790 sf.
  - The drywells are proposed to handle 1 and half building or 790 sf + 395 sf = 1,185 sf
- Based on the sizing, the drywell configuration maybe to be adjusted during the construction document phase. All drainage shall meet the 50 year storm requirements.

Page 6: Item 5 – 50 year storm:

- The ZBA requested the stormwater controls be sized at 50 year storms.
- The submitted Stormwater Management Plan address the 2, 10 and 100 year concerns.

Page 6: Item 6 – Sheet Flow:

- Stormwater management report has been prepared and submitted for review.

Page 6: Item 7 – Water back up into the catch basin:

- Stormwater management report has been submitted along with the updated drainage calculations.

Page 6: Item 9– Additional Comment:

- Stormwater management report has been submitted along with the updated drainage calculations.

Page 7: Item 10, 11 & 12 – Additional Comments:

- #10 –The elevations have been edited.
- #11 – We are assuming some of the “benches” as described in the erosion control documents will allow the catch basin grates to be constructed to allow water to enter the system. We would envision straw wattles or Bio-logs to be used if needed.
- #12 – Sheet 1 of 6 now reflects boulders along the entrance off Highland so as to protect the drainage swale.

Page 7: Item #2 – Comments on Other Utilities:

- There will be 3 feet of cover over the leaching field. Siting a short post light, including the underground conduit (18” below ground +/-), will not impact the field

Page 7 to 9: Other Site Design Comments:

- #1 – The phasing of the project will still need to be worked out given the water main work by the Town.
- #2 – Sheet 6 of 6 has been prepared to address the erosion controls through-out the site. The protocols identified on Sheet 6 and within the Safe Harbor Documents shall be incorporated into the phasing of the project, in conjunction with the Town’s work.
- #3 – Cuts and Fills of the updated plans are attached for review.
- #4 – Erosion control plan has been developed for the entire site so as to be incorporated with the phasing of the project, in conjunction with the Town’s work.
- #5 – The travel way for the highway is about 125 feet to the west of the project area and is about 8 to 10 feet below the elevation of the western property line in the area of buildings 10-12, 14-16 and 18-20. The intent is to add additional screening within the landscape plan so as to enhance the existing screening to the highway. The developer has no authority to plant within the highway-DOT layout.
- #6 – Landscape plan addresses the subsurface leaching facility and the location of the planting material. Note, the leaching facility is proposed to be 3 feet below ground. The types of plants over the leaching facility are shrubs and plants with shallow root systems. The two small shad trees will be relocated away from the leach facility.
- #11 – Snow removal: In the event of a large snow fall, the snow will be stored to the west of the entrance drive, the area to the south of units 2-4, at the corners of the building #21, in front of

the rear units, to the north of the rear drainage swale and around the visitor parking within the central common area.

- #14 – The project does not offer any proposal for invasive species. The existing vegetation appears to be native.

Attached for additional review and information are the testing results of two commercial developments being served by the same technology as proposed for the Cloverleaf Project. The two testing results show excellent treatment capabilities for proposed specified technology. These results hadn't been previously submitted due to the drastic differences in the properties between commercial/restaurant uses and residential use. Although not applicable to the residential waste stream, the results should give the ZBA and BOH reassurance of the ability of the technology to treat to a 10 ppm level.

Attachments:

1. Roof Runoff Calculations
2. Cuts & Fills (Williams Building Company)
3. Testing Results – Medical Facility (AdCare)
4. Testing Results – Commercial Restaurant

**(Roof Runoff)8446A.Cloverleaf**

Type II 24-hr 50-year Rainfall=6.23"

Prepared by J.M. O'Reilly & Associates, Inc.

Printed 6/8/2020

HydroCAD® 10.00-22 s/n 08678 © 2018 HydroCAD Software Solutions LLC

**Summary for Pond 7P: (3) 6'x6' Leach Pits, w/ 3' stone**

Inflow Area = 0.135 ac, 100.00% Impervious, Inflow Depth > 5.99" for 50-year event  
 Inflow = 1.41 cfs @ 11.90 hrs, Volume= 0.067 af  
 Outflow = 0.18 cfs @ 12.01 hrs, Volume= 0.067 af, Atten= 87%, Lag= 6.6 min  
 Discarded = 0.18 cfs @ 12.01 hrs, Volume= 0.067 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 55.28' @ 12.01 hrs Surf.Area= 339 sf Storage= 985 cf

Plug-Flow detention time= 40.2 min calculated for 0.067 af (100% of inflow)  
 Center-of-Mass det. time= 40.1 min ( 775.3 - 735.1 )

Volume	Invert	Avail.Storage	Storage Description
#1	50.00'	509 cf	6.00'D x 6.00'H Vertical Cone/Cylinder x 3 Inside #2
#2	50.00'	611 cf	12.00'D x 6.00'H Vertical Cone/Cylinder x 3
			2,036 cf Overall - 509 cf Embedded = 1,527 cf x 40.0% Voids
		1,120 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	50.00'	8.270 in/hr Exfiltration over Wetted area Phase-In= 0.01'

**Discarded OutFlow** Max=0.18 cfs @ 12.01 hrs HW=55.28' (Free Discharge)  
 ↳ **1=Exfiltration** (Exfiltration Controls 0.18 cfs)



Regarding the requirements of Section 8 - Soil Removal of the General Bylaws of the Town of Truro:

Williams Building Company has calculated the following volumes for the Cloverleaf Rental Housing Development as proposed per the Site Plan dated 6/5/2020 prepared by J.M. O'Reilly Associates, Civil Engineers.

CUT & STOCKPILE: 1,280 cubic yards  
CUT groundcover and "duff layer" for reuse

CUT & FILL: 7,793 cubic yards  
CUT from elevation 55' to 62' at center (east) of site;  
FILL at rear (north east) of site elevation 36' to 46'

EXCAVATE & BACKFILL: 5,122 cubic yards for building foundations

CUT & REMOVE: 8,918 cubic yards  
CUT from access roadway and CUT from elevation 55' to 62'  
REMOVE / EXPORT from site

AdCare

North Kingstown, RI

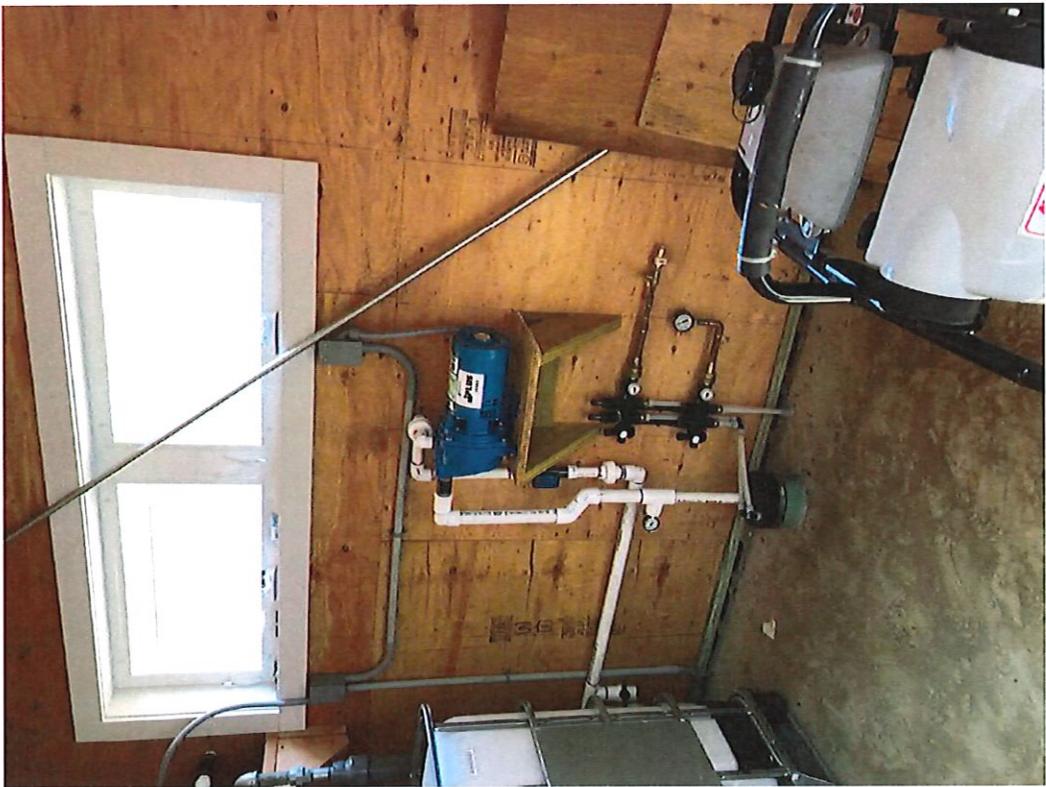
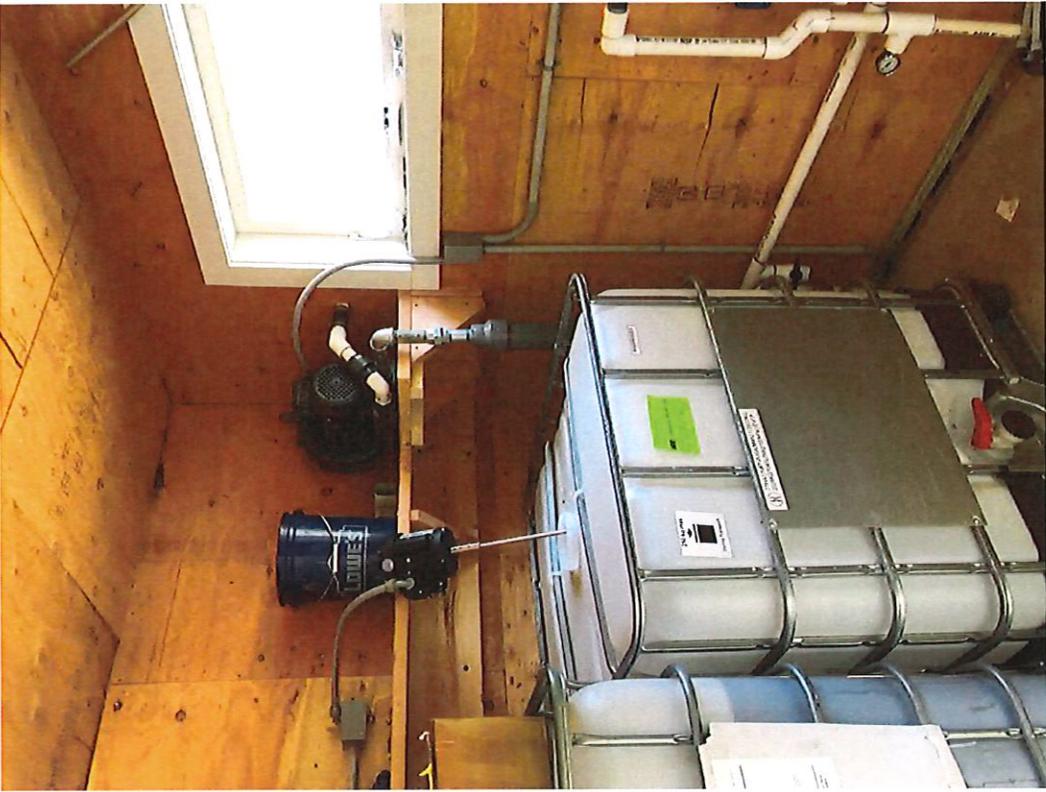
## RI Medical Facility - 2018 Installation – Startup August 2018

- Design flow 1,450 gpd
- Actual flow 800-1,200 gpd
- Designed on; influent BOD 480 mg/L, influent TKN 105 mg/L, influent TSS 580 mg/L
- Actual influent numbers: 100 – 400 mg/L BOD (peak of 1,300 mg/L); 80-140 mg/L TKN (peak of 195 mg/L)
- Effluent Limits: <30 mg/L BOD, <30 mg/L TSS, <19 mg/L TN
- Effluent results: <4 mg/L BOD, <4 mg/L TSS, <10 mg/L TN

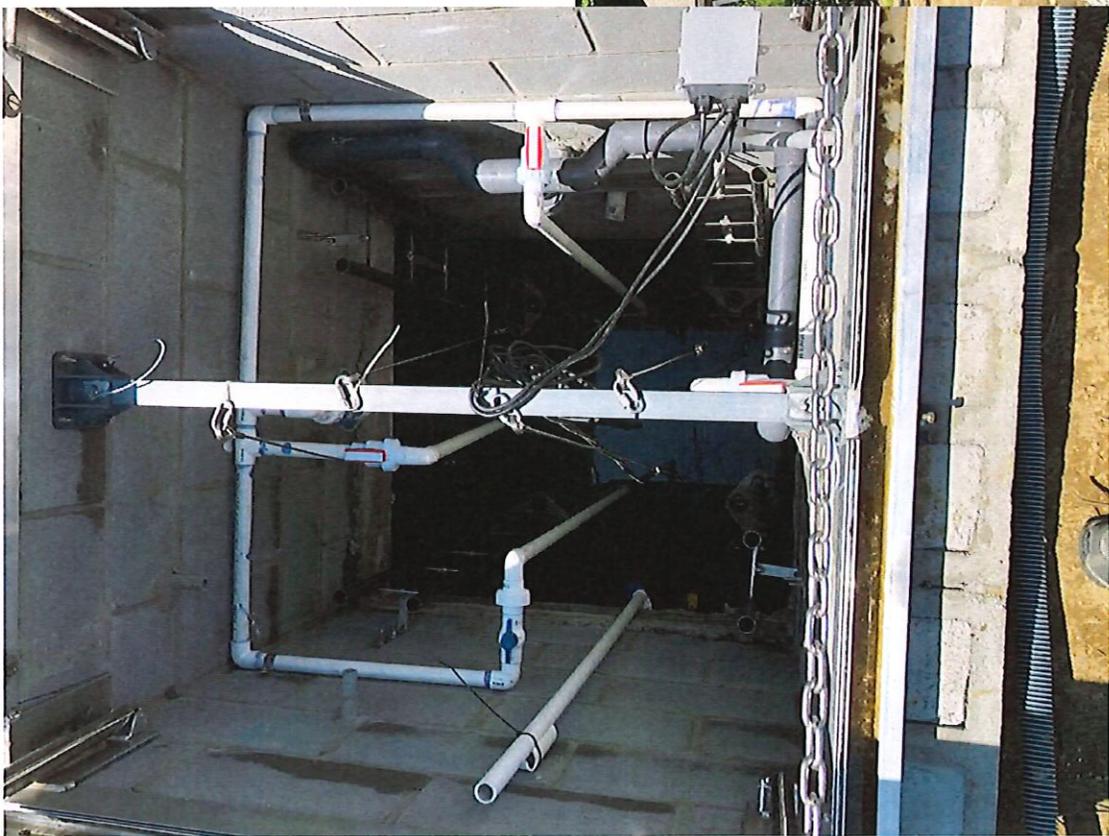
## HSMBR 3.0-N

- Installed in a 6,500 two compartment concrete tank
- 3,500 gallon settling tank - 1,500 gallon flow eq tank - BioBarrier tank - 1,000 gallon pump chamber - dispersed to Bottomless Sand Filter





5/2/2019



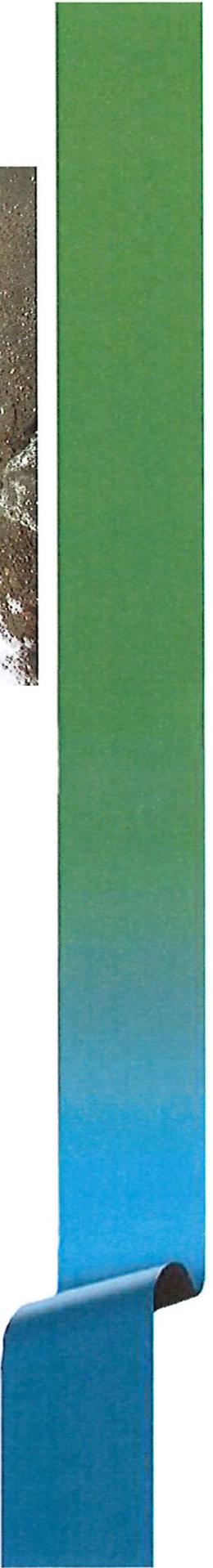
5/2/2019

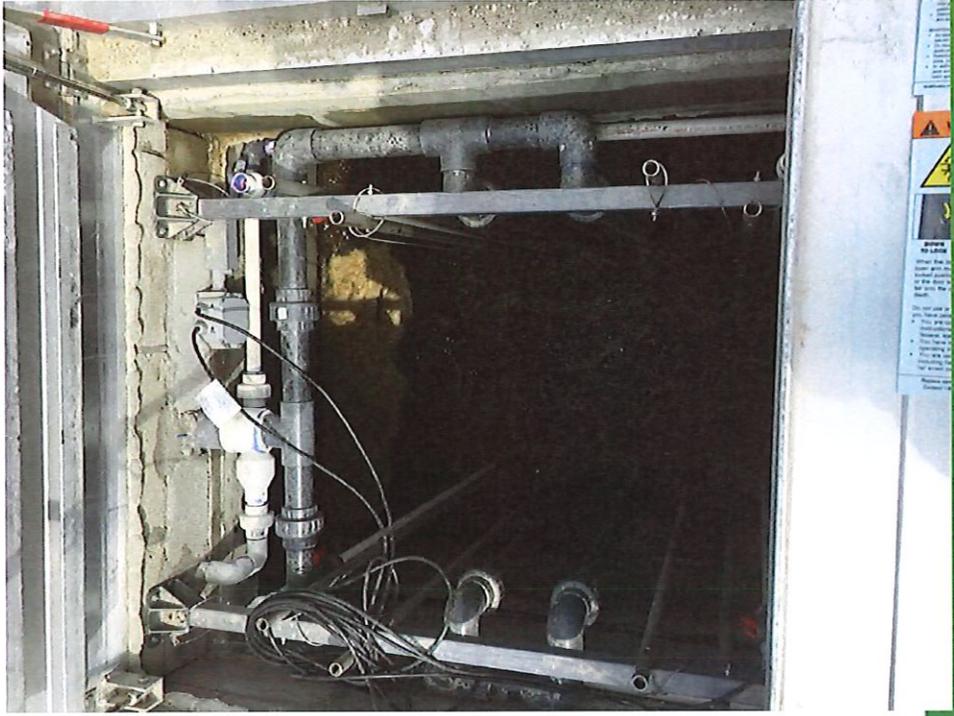
# Commercial BioBarrier Installation

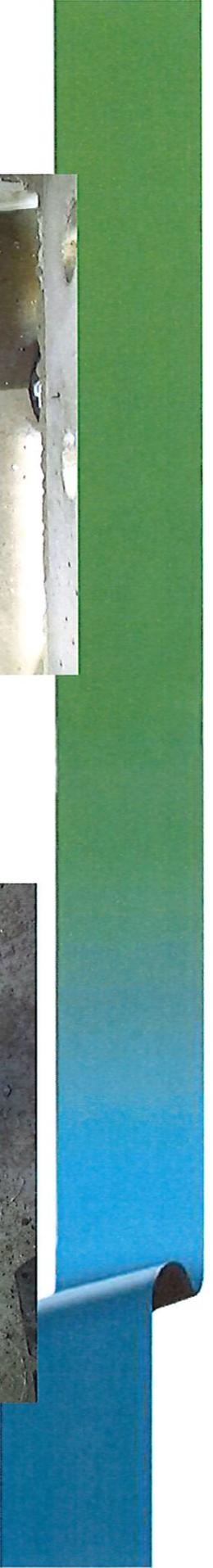
- Seafood Restaurant
- Peak flows of 5,000+  
gpd
- Average flows of 3,500  
gpd
- Startup May 2016















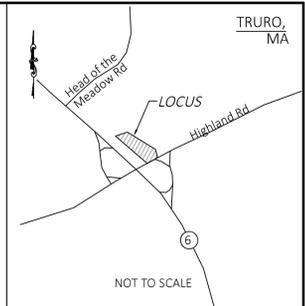
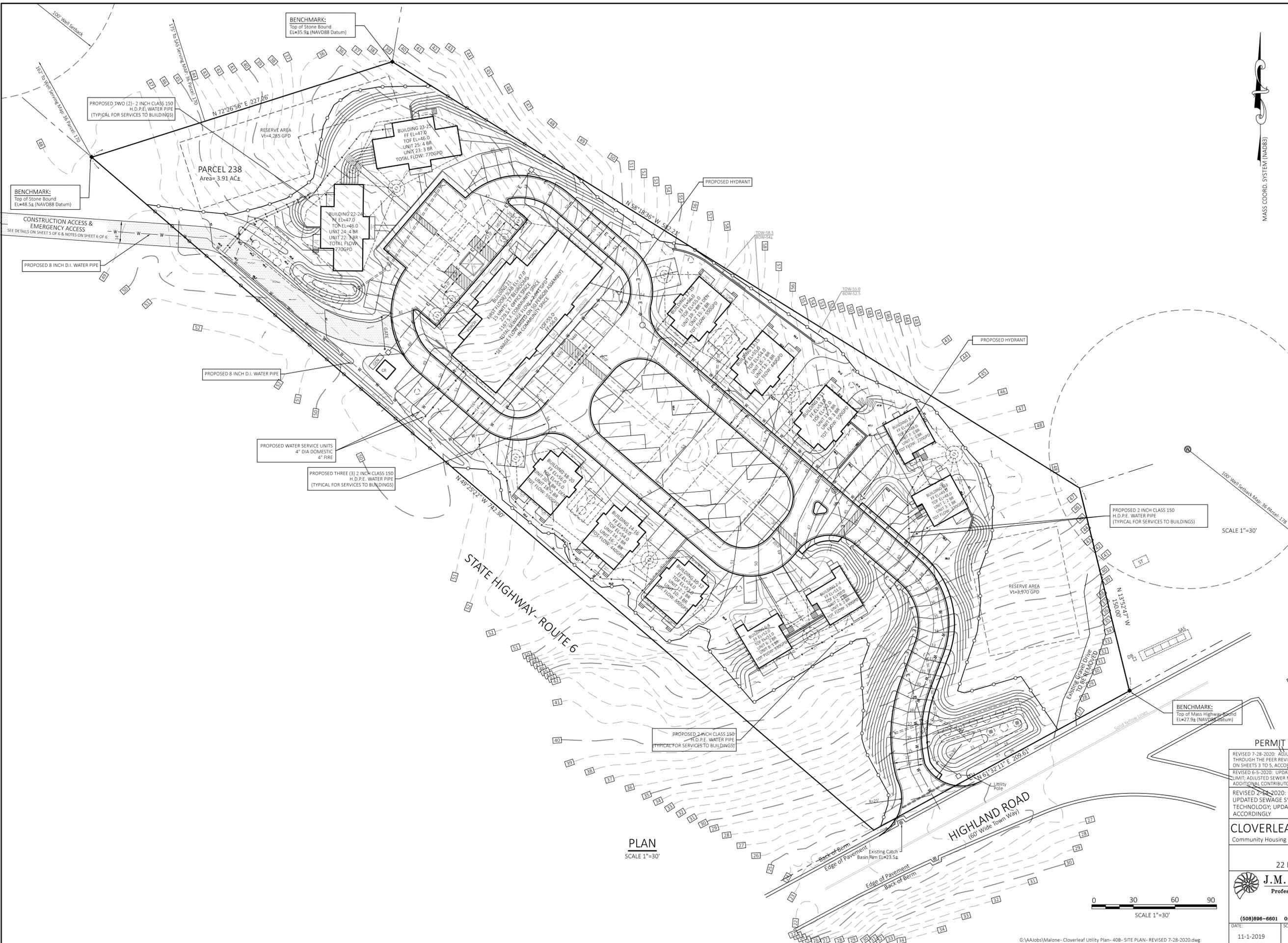




# Test Results

Date	Influent BOD	Influent TSS	Influent pH	Influent TKN	Effluent BOD	Effluent TSS	Effluent pH	Effluent TN
Sept. 2018	476	80	6.5	41.4	8.8	<4.0	7.4	5.84
Oct. 2018	297	55	7.2	106	<4.0	<4.0	7.6	2.61
Nov. 2018	162	75	6.9	59	<4.0	<4.0	7.3	4.66
Dec. 2018	785	276	6	74.55	<4.0	<4.0	7.3	5.84
Jan. 2019	320	117	7.1	87.2	<4.0	<4.0	7.1	10.25
Feb. 2019	1170	2870	7.5	124	4.66	<4.0	7.3	22.9* carbon feed issue
March 2019	339	85	7.1	85.2	4.42	<4.0	7.4	5.28
April 2019	391	126	6.9	114	<4.0	<4.0	7.6	6.41
May 2019	286	61	6.8	143	<4.0	<4.0	7.2	7.41
June 2019	252	84	6.7	135	<4.0	<4.0	7.2	9.06
July 2019	120	92	6.6	137	<4.0	<4.0	6.9	4.85
Aug. 2019	170	72	6.8	125	<4.0	27	7.2	12.27
Sept. 2019	110	36	6.9	195	<4.0	5.5	7.4	4.11
Oct. 2019	210	40	6.8	126	<4.0	6	7.3	9.38
Nov. 2019	255	52	7	104	<4.0	<4.0	6.9	13.58
Dec. 2019	270	40	7.3	148	<4.0	<4.0	6.1	33.37* power outage
Jan. 2020	278	64	7.4	114	<4.0	<4.0	7.5	7.19
Feb. 2020	420	48	7.2	125	<4.0	<4.0	7.4	4.08

Avg = 7.1



PLAN BOOK 672  
ASSESSORS' MAP 36

PAGE 34  
PARCEL 238

**LEGEND**

— 22	EXISTING CONTOUR
— 32	PROPOSED CONTOUR
x12.34	EXISTING SPOT GRADE
24x5	PROPOSED SPOT GRADE
— W	WATER SERVICE LINE
— E	UNDERGROUND UTILITY SERVICE
— G	GAS SERVICE LINE
— S	TEST HOLE / BORING LOCATION
ST	SEPTIC TANK
DB	DISTRIBUTION BOX
SAS	SOIL ABSORPTION SYSTEM
Reserve	RESERVED FOR FUTURE
UT	UTILITY POLE
CB	CATCH BASIN
FD	FIRE HYDRANT
W	WELL
DM	DRAINAGE MANHOLE
—	CONCRETE BOUND, FOUND
—	TOP OF BANK
—	LIMIT OF WORK
—	FENCE
PT	UNDERGROUND PROPANE TANK
LD	12' x 6' LEACHING DRYWELL (ROOF)
—	TRANSFORMER PAD - UTILITY CLUSTER
GEN	GENERATOR

SCALE 1"=30'

**PLAN**  
SCALE 1"=30'

SHEET 1 OF 6  
**PERMIT SET - NOT FOR CONSTRUCTION**

REVISED 7-28-2020: ADJUSTED SEWAGE SYSTEM AND DRAINAGE FACILITIES AS REQUESTED THROUGH THE PEER REVIEW. MODIFIED SWALE AND DRAINAGE FACILITIES; MODIFIED NOTES ON SHEETS 3 TO 5, ACCORDINGLY.

REVISED 6-5-2020: UPDATED SEWAGE SYSTEM TREATMENT TO INCLUDE 10 PPM NITROGEN LIMIT; ADJUSTED SEWER MANHOLE LAYOUT; ADJUSTED DRAINAGE TO INCLUDE SWALES AND ADDITIONAL CONTRIBUTORY AREAS; UPDATED NOTES AND DETAILS ACCORDINGLY.

REVISED 2-14-2020: UPDATED BUILDING LAYOUT, ADJUSTED ENTRANCE; UPDATED SEWAGE SYSTEM COLLECTION AND ADDED I.A. TREATMENT TECHNOLOGY; UPDATED WATER SERVICE LAYOUT AND DRAINAGE ACCORDINGLY.

**CLOVERLEAF TRURO RENTAL HOUSING**  
Community Housing Resource, Inc.; P.O. Box 1015, Provincetown, MA 02657

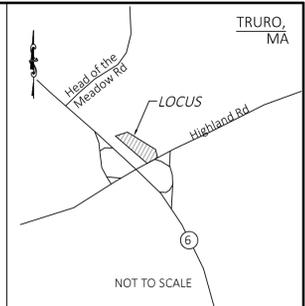
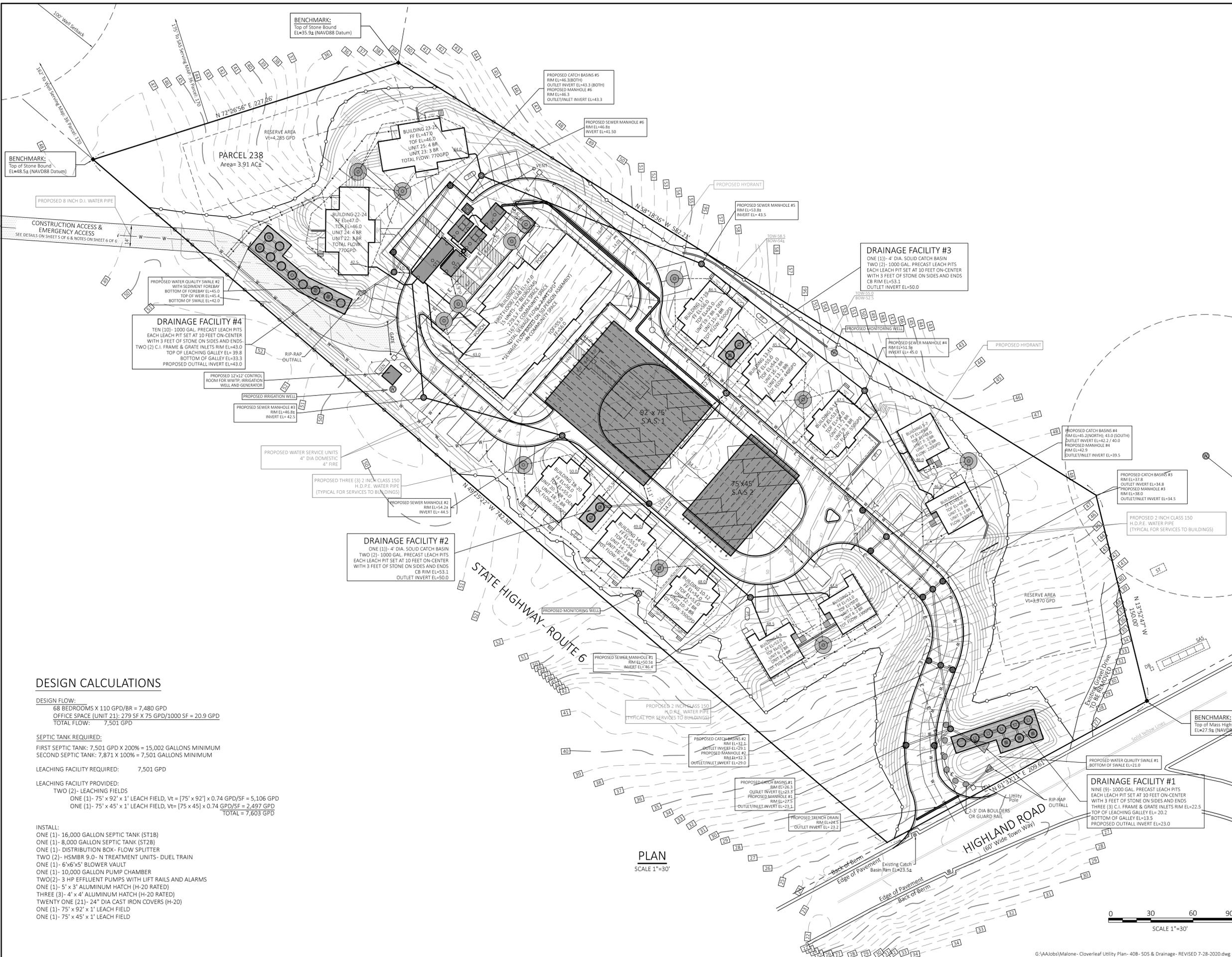
**SITE PLAN**  
22 HIGHLAND ROAD, TRURO, MA

**J.M. O'REILLY & ASSOCIATES, INC.**  
Professional Engineering & Land Surveying Services

1573 Main Street - Route 6A  
P.O. Box 1773  
Brewster, MA 02631 (508)896-6602 Fax

DATE: 11-1-2019 SCALE: As Noted BY: RFR CHECK: JMO JOB NUMBER: JMO-8446A





PLAN BOOK 672 PAGE 34  
 ASSESSORS' MAP 36 PARCEL 238

LEGEND	
	EXISTING CONTOUR
	PROPOSED CONTOUR
	EXISTING SPOT GRADE
	PROPOSED SPOT GRADE
	WATER SERVICE LINE
	UNDERGROUND UTILITY SERVICE
	GAS SERVICE LINE
	TEST HOLE / BORING LOCATION
	SEPTIC TANK
	DISTRIBUTION BOX
	SOIL ABSORPTION SYSTEM
	RESERVED FOR FUTURE
	UTILITY POLE
	CATCH BASIN
	FIRE HYDRANT
	WELL
	DRAINAGE MANHOLE
	STORMWATER FLOW ARROW
	CONCRETE BOUND, FOUND
	TOP OF BANK
	LIMIT OF WORK
	FENCE
	UNDERGROUND PROPANE TANK
	12' x 6' LEACHING DRYWELL (ROOF)
	TRANSFORMER PAD - UTILITY CLUSTER
	GENERATOR

SCALE 1"=30'

SHEET 2 OF 6  
 PERMIT SET - NOT FOR CONSTRUCTION

REVISED 7-28-2020: ADJUSTED SEWAGE SYSTEM AND DRAINAGE FACILITIES AS REQUESTED THROUGH THE PEER REVIEW. MODIFIED SWALE AND DRAINAGE FACILITIES; MODIFIED NOTES ON SHEETS 3 TO 5, ACCORDINGLY.  
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**CLOVERLEAF TRURO RENTAL HOUSING**  
 Community Housing Resource, Inc.; P.O. Box 1015, Provincetown, MA 02657

**SEWAGE-DRAINAGE SITE PLAN- 40B PERMIT SET**  
 22 HIGHLAND ROAD, TRURO, MA

**J.M. O'REILLY & ASSOCIATES, INC.**  
 Professional Engineering & Land Surveying Services

1573 Main Street - Route 6A  
 P.O. Box 1773  
 Brewster, MA 02631 (508)896-6602 Fax  
 (508)896-6601 Office  
 DATE: 11-1-2019 SCALE: As Noted BY: RFR CHECK: JMO JOB NUMBER: JMO-8446A

**DESIGN CALCULATIONS**

DESIGN FLOW:  
 68 BEDROOMS X 110 GPD/BR = 7,480 GPD  
 OFFICE SPACE (UNIT 21): 279 SF X 75 GPD/1000 SF = 20.9 GPD  
 TOTAL FLOW: 7,501 GPD

SEPTIC TANK REQUIRED:  
 FIRST SEPTIC TANK: 7,501 GPD X 200% = 15,002 GALLONS MINIMUM  
 SECOND SEPTIC TANK: 7,871 X 100% = 7,501 GALLONS MINIMUM

LEACHING FACILITY REQUIRED: 7,501 GPD

LEACHING FACILITY PROVIDED:  
 TWO (2)- LEACHING FIELDS  
 ONE (1)- 75' x 92' x 1' LEACH FIELD, Vt = [75' x 92'] x 0.74 GPD/SF = 5,106 GPD  
 ONE (1)- 75' x 45' x 1' LEACH FIELD, Vt = [75 x 45] x 0.74 GPD/SF = 2,497 GPD  
 TOTAL = 7,603 GPD

INSTALL:  
 ONE (1)- 16,000 GALLON SEPTIC TANK (ST1B)  
 ONE (1)- 8,000 GALLON SEPTIC TANK (ST2B)  
 ONE (1)- DISTRIBUTION BOX - FLOW SPLITTER  
 TWO (2)- HSMBR 9.0- N TREATMENT UNITS- DUEL TRAIN  
 ONE (1)- 6'x6'x5' BLOWER VAULT  
 ONE (1)- 10,000 GALLON PUMP CHAMBER  
 TWO(2)- 3 HP EFFLUENT PUMPS WITH LIFT RAILS AND ALARMS  
 ONE (1)- 5' x 3' ALUMINUM HATCH (H-20 RATED)  
 THREE (3)- 4' x 4' ALUMINUM HATCH (H-20 RATED)  
 TWENTY ONE (21)- 24" DIA CAST IRON COVERS (H-20)  
 ONE (1)- 75' x 92' x 1' LEACH FIELD  
 ONE (1)- 75' x 45' x 1' LEACH FIELD

PLAN  
 SCALE 1"=30'

0 30 60 90  
 SCALE 1"=30'

### GENERAL NOTES:

- NEITHER DRIVEWAYS NOR PARKING ARE ALLOWED OVER SEPTIC SYSTEM UNLESS H-20 COMPONENTS ARE USED.
- THE DESIGNER WILL NOT BE RESPONSIBLE FOR THE SYSTEM AS DESIGNED UNLESS CONSTRUCTED AS SHOWN. ANY CHANGES SHALL BE APPROVED IN WRITING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL UNDERGROUND AND OVERHEAD UTILITIES PRIOR TO COMMENCEMENT OF WORK.

### CONSTRUCTION NOTES:

- ALL CONSTRUCTION SHALL CONFORM TO THE STATE ENVIRONMENTAL CODE, TITLE 5, AND THE REQUIREMENTS OF THE LOCAL BOARD OF HEALTH.
- SEPTIC TANK(S), GREASE TRAP(S), DOSING CHAMBER(S) AND DISTRIBUTION BOXES SHALL BE SET ON A LEVEL STABLE BASE WHICH HAS BEEN MECHANICALLY COMPACTED, OR ON A 6 INCH CRUSHED STONE BASE.
- SEPTIC TANK(S) SHALL MEET ASTM STANDARD C1127-93 AND SHALL HAVE AT LEAST THREE 20" DIAMETER MANHOLES. THE MINIMUM DEPTH FROM THE BOTTOM OF THE SEPTIC TANK TO THE FLOW LINE SHALL BE 48".
- SCHEDULE 40 PVC INLET AND OUTLET TEES SHALL EXTEND A MINIMUM OF 6" ABOVE THE FLOW LINE OF THE SEPTIC TANK AND SHALL BE INSTALLED ON THE CENTERLINE OF THE TANK DIRECTLY UNDER THE CLEANOUT MANHOLE.
- RAISE COVERS OF THE SEPTIC TANK AND DISTRIBUTION BOX WITH PRECAST CONCRETE WATER TIGHT RISERS OVER INLET AND OUTLET TEES TO WITHIN 6" OF FINISH GRADE, OR AS APPROVED BY THE LOCAL BOARD OF HEALTH AGENT.
- ALL SEWER PIPING SHALL CONSIST OF 6" SDR-35 OR EQUIVALENT. PIPE SHALL BE LAID ON A MINIMUM CONTINUOUS GRADE OF NOT LESS THAN 1% OR AS SPECIFIED.
- DISTRIBUTION LINES FOR SOIL ABSORPTION SYSTEM (AS REQUIRED) SHALL BE 1 1/2" DIA. SCHEDULE 40 PVC. SEE DETAILS FOR ADDITIONAL INFORMATION.
- OUTLET PIPES FROM DISTRIBUTION BOX SHALL REMAIN LEVEL FOR AT LEAST 2' BEFORE PITCHING TO SOIL ABSORPTION SYSTEM. WATER TEST DISTRIBUTION BOX TO ASSURE EVEN DISTRIBUTION.
- DISTRIBUTION BOX SHALL HAVE A MINIMUM SUMP OF 6" MEASURED BELOW THE OUTLET INVERT.
- BASE AGGREGATE FOR THE LEACHING FACILITY SHALL CONSIST OF 3/4" TO 1-1/2" DOUBLE WASHED STONE FREE OF IRON, FINES AND DUST AND SHALL BE INSTALLED BELOW THE CROWN OF THE DISTRIBUTION LINE TO THE BOTTOM OF THE SOIL ABSORPTION SYSTEM. BASE AGGREGATE SHALL BE COVERED WITH A 2" LAYER OF 1/8" TO 1/2" DOUBLE WASHED STONE FREE OF IRON, FINES AND DUST.
- VENT SOIL ABSORPTION SYSTEM WHEN DISTRIBUTION LINES EXCEED 50 FEET; WHEN LOCATED EITHER IN WHOLE OR IN PART UNDER DRIVEWAYS, PARKING AREAS, TURNING AREAS OR OTHER IMPERVIOUS MATERIAL; OR WHEN PRESSURE DOSED.
- SOIL ABSORPTION SYSTEM SHALL BE COVERED WITH A MINIMUM OF 9" OF CLEAN MEDIUM SAND (EXCLUDING TOPSOIL).
- FINISH GRADE SHALL BE A MAXIMUM OF 36" OVER THE TOP OF ALL SYSTEM COMPONENTS, INCLUDING THE SEPTIC TANK, DISTRIBUTION BOX, DOSING CHAMBER AND SOIL ABSORPTION SYSTEM. SEPTIC TANKS SHALL HAVE A MINIMUM COVER OF 9".
- FROM THE DATE OF INSTALLATION OF THE SOIL ABSORPTION SYSTEM UNTIL RECEIPT OF A CERTIFICATE OF COMPLIANCE, THE PERIMETER OF THE SOIL ABSORPTION SYSTEM SHALL BE STAKED AND FLAGGED TO PREVENT THE USE OF SUCH AREA FOR ALL ACTIVITIES THAT MIGHT DAMAGE THE SYSTEM.
- THE BOARD OF HEALTH SHALL REQUIRE INSPECTION OF ALL CONSTRUCTION BY AN AGENT OF THE BOARD OF HEALTH (OR THE DESIGNER IF THIS SYSTEM REQUIRES A VARIANCE) AND MAY REQUIRE SUCH PERSON TO CERTIFY IN WRITING THAT ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE TERMS OF THE PERMIT AND APPROVED PLANS. 48 HOURS ADVANCE NOTICE IS REQUESTED.
- two (2) 4" PVC INSPECTION PORT TO BE RAISED TO WITHIN 3" OF FINISH GRADE FOR EACH LEACHING FIELD. BOTH INSPECTION PORTS TO BE PROVIDED WITH CAST IRON CLEANOUT COVERS AT FINISH GRADE. REFER TO S.A.S. DETAIL 17.)
- INSTALLER TO CONFIRM LOCATION OF ALL UNDERGROUND AND OVERHEAD UTILITIES PRIOR TO START OF CONSTRUCTION.
- WATER/SEWER CROSSING: WASTELINE SHALL BE A 20" SECTION OF PVC PIPE CENTERED OVER THE WATER LINE TO MAXIMIZE DISTANCE TO JOINTS.
- BUILDING SEWER CLEAN-OUT: A 4" DIA PVC CLEAN OUT PIPE SHALL BE PROVIDED AT ALL BUILDING CONNECTIONS FOR THE SEWER LINES. CLEAN-OUT PIPE SHALL BE FINISHED WITH A 4 INCH DIA SCREW CAP BROUGHT TO FINISH GRADE.
- SEWER BENDS: A 4" DIA PVC CLEAN OUT SHALL BE PROVIDED AT ALL SEWER PIPE BENDS GREATER THAN 22.5". THE CLEAN-OUT SHALL BE FINISHED WITH A 4" DIA SCREW CAP BROUGHT TO FINISH GRADE. THE SCREW CAP SHALL BE PROTECTED BY INSTALLING AN 8" DIA C.I. CURB BOX.

### SOIL LOGS:

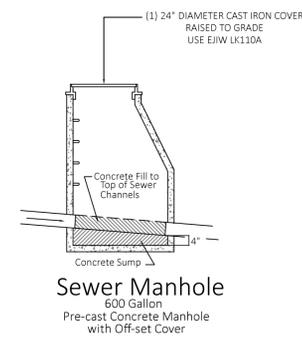
HAND AUGER 1: EL = 58.04

DEPTH FROM SURFACE (INCHES)	SOIL HORIZON	SOIL TEXTURE (USDA)	SOIL COLOR (MUNSELL)	SOIL MOTTLING	OTHER
0-6	A	FINE LOAMY SAND	10YR3/1		
6-24	C1	COARSE SAND	10YR7/8	NONE	
24-186	C2	COARSE SAND	10YR6/4		NO WATER ENCOUNTERED

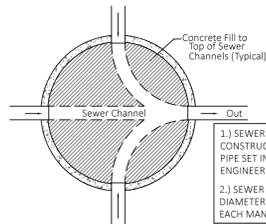
DATE OF TESTING: 10-16-2018  
 PERCOLATION RATE: LESS THAN 52 MIN/INCH IN C1 LAYERS (ASSUMED)  
 WITNESSED BY: ROBERT REEDY, EIT, J.M. O'REILLY & ASSOCIATES, INC.  
 NO GROUNDWATER WAS ENCOUNTERED.  
 USE A LOADING RATE OF 0.74 GPD/SF FOR SIZING OF SOIL ABSORPTION SYSTEM.

### PROFILE OF SEWER MANHOLES:

NOT TO SCALE



**Sewer Manhole**  
600 Gallon  
Pre-cast Concrete Manhole  
with Off-set Cover



**Sewer Manhole**  
PLAN VIEW  
Not To Scale

- SEWER CHANNELS SHALL BE CONSTRUCTED OF BRICK OR PVC PIPE SET IN CONCRETE OR OF ENGINEER APPROVED EQUAL.
- SEWER CHANNELS MUST MATCH DIAMETER OF OUTLET PIPE FOR EACH MANHOLE.

### PUMP DOSING PROGRAM:

- BOTH PUMPS MUST BE CAPABLE OF PUMPING AT LEAST 90 GPM AGAINST A TOTAL DYNAMIC HEAD OF 30' ± (USE (2) MYERS EFF. PUMP - 2 HP OR ENGINEER APPROVED EQUIVALENT).
- BOTH PUMPS SHALL BE OPERATED ON A TIMER CYCLE.  
 SAS #1 PUMP: SHALL RUN FOR MAXIMUM OF 5 MINUTES EVERY 30 MINUTES:  
 TOTAL DOSE PER HOUR = 900 GALLONS;  
 SAS #2 PUMP: PUMP SHALL RUN FOR A MAXIMUM OF 3 MINUTES EVERY 30 MINUTES:  
 TOTAL DOSE PER HOUR = 340 GALLONS

- FLOAT SYSTEM:**  
 LOW WATER FLOAT - BOTH PUMPS OFF  
 OPERATIONAL FLOAT - BOTH PUMPS ARE AVAILABLE FOR CYCLE PUMPING  
 HIGH WATER FLOAT - ALTERNATE PUMP ENGAGES AND PUMPS TO LOW WATER FLOAT IS ENGAGED  
 HIGH WATER ALARM FLOAT - ALARM SOUNDS - REMOTE DIALER IS ENGAGED TO WWTP OPERATOR.

### NOTE:

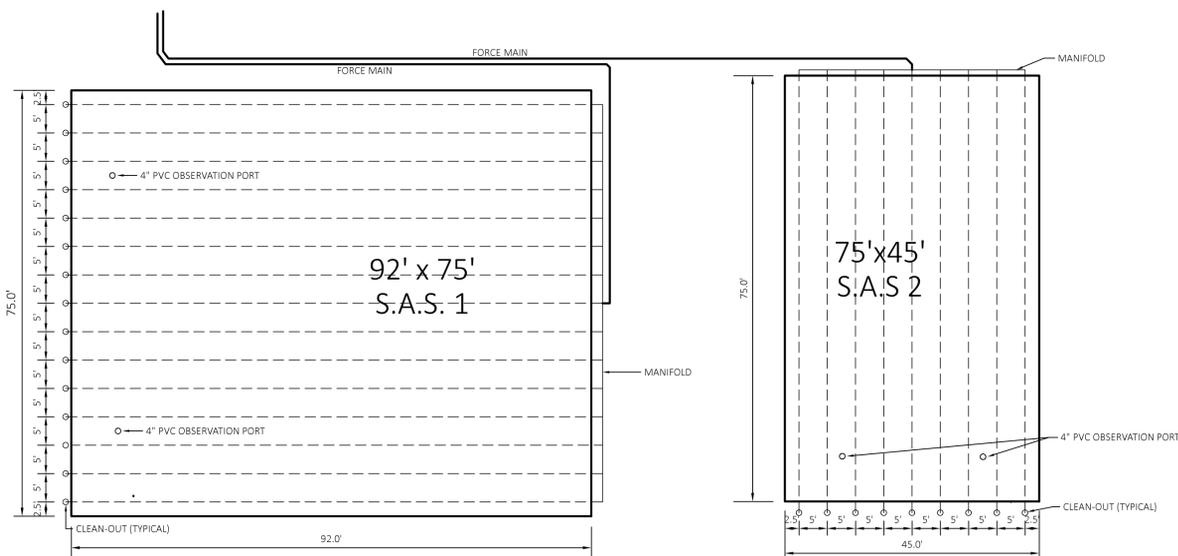
ONCE PUMPS INSTALLED WITHIN CHAMBER, TIMING AND DOSAGE SHALL BE ADJUSTED TO REFLECT ACTUAL PUMP DISCHARGE AND FLOW RATES.

### OPERATIONAL NOTES & REQUIREMENTS:

- ALL WIRING AND CONNECTIONS SHALL BE IN COMPLIANCE WITH THE MA STATE ELECTRICAL CODE AS WELL AS TO THE MANUFACTURER'S SPECIFICATIONS. ALL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN.
- THE ALARM SHALL CONSIST OF A RED WARNING LIGHT, AN AUDIBLE ALARM AND A REMOTE DIALER SO AS TO NOTIFY THE WWTP OPERATOR OF THE ALARM EVENT. LIGHT AND ALARM SHALL BE MOUNTED TO THE SIDE OF THE CONTROL BUILDING.
- ALL CORDS FOR PUMPS AND FLOATS SHALL BE CONTINUOUS FROM THE TREATMENT WORKS TO THE JUNCTION DISCONNECT BOX.
- JUNCTION DISCONNECT BOX SHALL BE LOCATED ADJACENT TO THE CONTROL BUILDING.

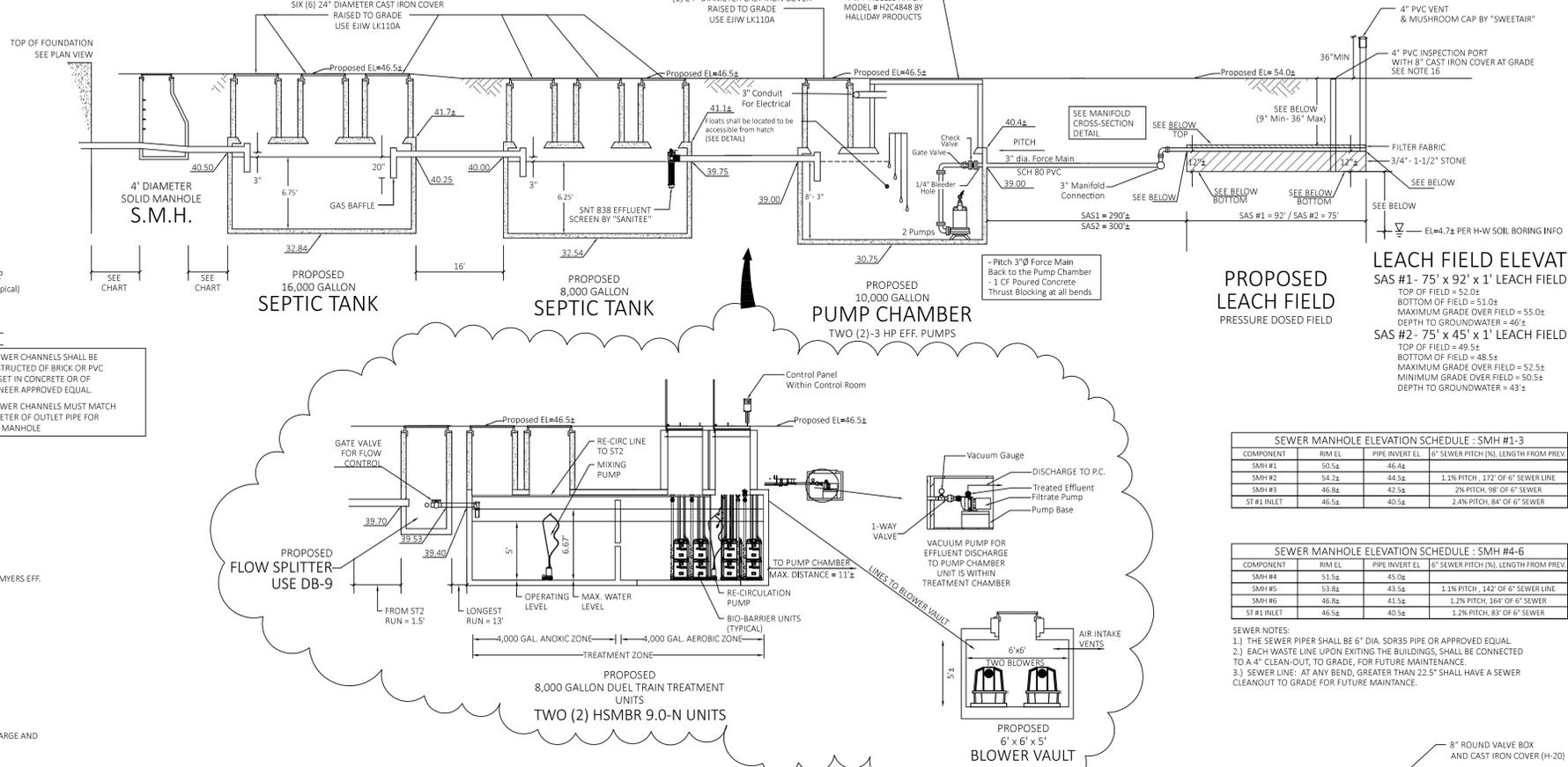
### SOIL ABSORPTION SYSTEM DETAIL:

NOT TO SCALE



### SCHEMATIC FLOW PROFILE:

NOT TO SCALE



### LEACH FIELD ELEVATIONS:

- SAS #1 - 75' x 92' x 1' LEACH FIELD**  
 TOP OF FIELD = 52.0±  
 BOTTOM OF FIELD = 53.0±  
 MAXIMUM GRADE OVER FIELD = 55.0±  
 DEPTH TO GROUNDWATER = 46±
- SAS #2 - 75' x 45' x 1' LEACH FIELD**  
 TOP OF FIELD = 49.5±  
 BOTTOM OF FIELD = 48.5±  
 MAXIMUM GRADE OVER FIELD = 52.5±  
 MINIMUM GRADE OVER FIELD = 50.5±  
 DEPTH TO GROUNDWATER = 43±

**SEWER MANHOLE ELEVATION SCHEDULE : SMH #1-3**

COMPONENT	RIM EL	PIPE INVERT EL	6" SEWER PITCH (%), LENGTH FROM PREV.
SMH #1	50.5±	46.4±	
SMH #2	54.2±	44.5±	1.1% PITCH, 172' OF 6" SEWER LINE
SMH #3	46.8±	42.5±	2% PITCH, 98' OF 6" SEWER
ST #1 INLET	46.5±	40.5±	2.4% PITCH, 84' OF 6" SEWER

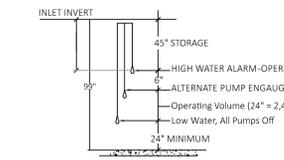
**SEWER MANHOLE ELEVATION SCHEDULE : SMH #4-6**

COMPONENT	RIM EL	PIPE INVERT EL	6" SEWER PITCH (%), LENGTH FROM PREV.
SMH #4	51.5±	45.0±	
SMH #5	53.8±	43.5±	1.1% PITCH, 142' OF 6" SEWER LINE
SMH #6	46.8±	41.5±	1.2% PITCH, 164' OF 6" SEWER
ST #1 INLET	46.5±	40.5±	1.2% PITCH, 83' OF 6" SEWER

- SEWER NOTES:**
- THE SEWER PIPER SHALL BE 6" DIA. SDR35 PIPE OR APPROVED EQUAL.
  - EACH WASTE LINE UPON EXITING THE BUILDINGS, SHALL BE CONNECTED TO A 4" CLEAN-OUT, TO GRADE, FOR FUTURE MAINTENANCE.
  - SEWER LINE: AT ANY BEND, GREATER THAN 22.5" SHALL HAVE A SEWER CLEANOUT TO GRADE FOR FUTURE MAINTENANCE.

### FLOAT DETAIL:

NOT TO SCALE

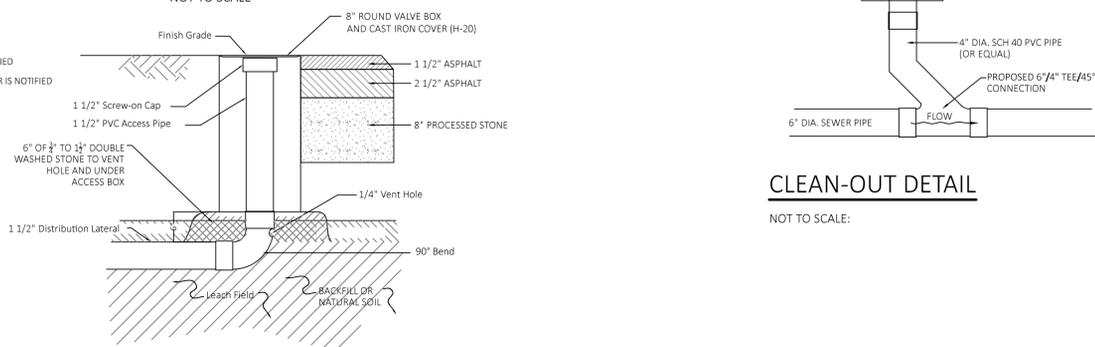


### \*FLOAT INSTALLATION NOTES:

- FLOATS SHALL BE INSTALLED WITH A CABLE WEIGHT AND SHALL NOT BE TETHERED TO THE DISCHARGE LINE IN ORDER TO ALLOW FOR THEM TO BE PULLED UP TO THE TOP OF PUMP CHAMBER.
- FLOATS SHALL BE INSTALLED SO THAT THEY CAN BE ACCESSED FROM OUTLET MANHOLE COVER.
- FLOATS MUST BE INSTALLED SO THAT THEY ARE FREE TO MOVE THROUGHOUT ITS TRAVEL AND NOT CONTACT THE PUMP BODY, PIPING, OR OTHER OBJECTS.

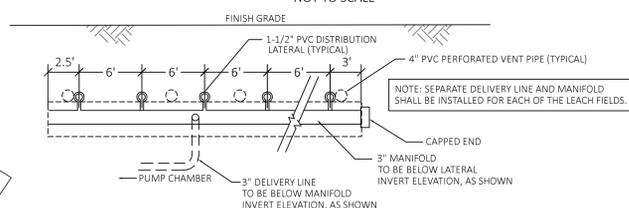
### DETAIL OF LATERAL ACCESS CAP

NOT TO SCALE



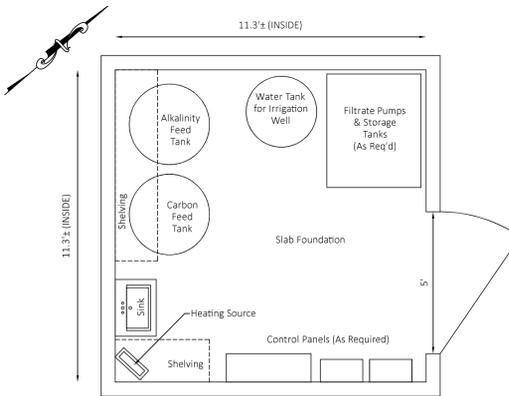
### MANIFOLD CROSS-SECTION DETAIL

NOT TO SCALE



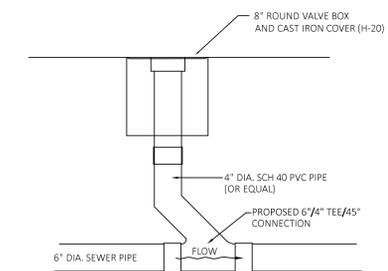
### CONTROL ROOM LAYOUT

SCALE: 1" = 3'



### CLEAN-OUT DETAIL

NOT TO SCALE:



### SHEET 3 OF 6

### PERMIT SET - NOT FOR CONSTRUCTION

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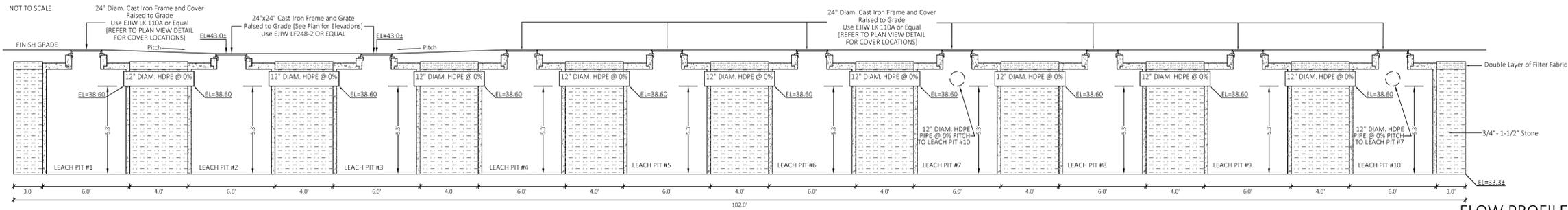
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**SEWAGE DETAILS- 40B PERMIT SET**  
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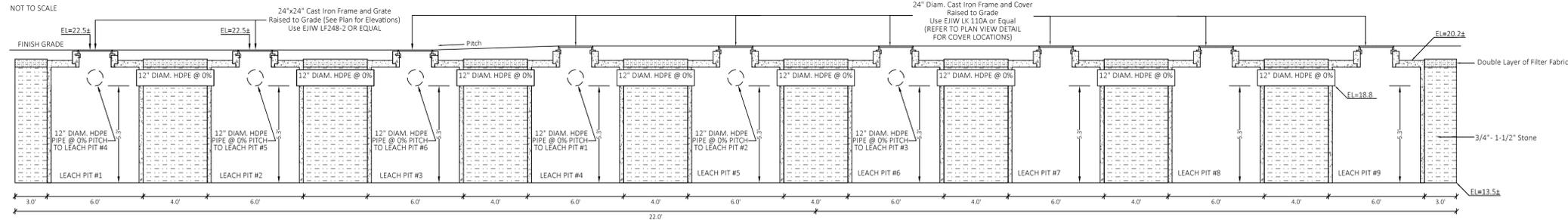
**FLOW PROFILE OF DRAINAGE FACILITY #4**



**PROPOSED LEACHING FACILITY**

USE TEN (10) 1000 GALLON PRECAST LEACHING PIT UNITS H-20 RATED UNITS AS MFG. BY SHOREY PRECAST OR EQUAL

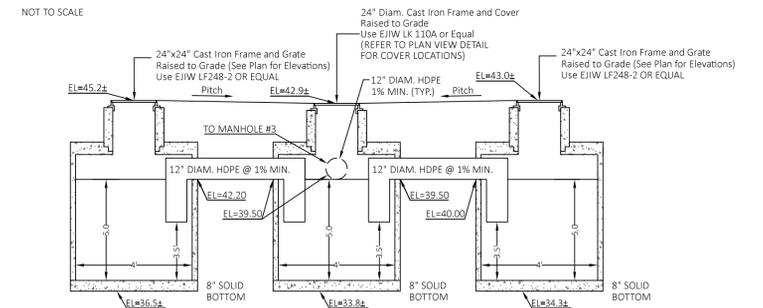
**FLOW PROFILE OF DRAINAGE FACILITY #1**



**PROPOSED LEACHING FACILITY**

USE NINE (9) 1000 GALLON PRECAST LEACHING PIT UNITS H-20 RATED UNITS AS MFG. BY SHOREY PRECAST OR EQUAL

**FLOW PROFILE OF CATCH BASINS & MANHOLE #4**



**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #4 (NORTH)**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

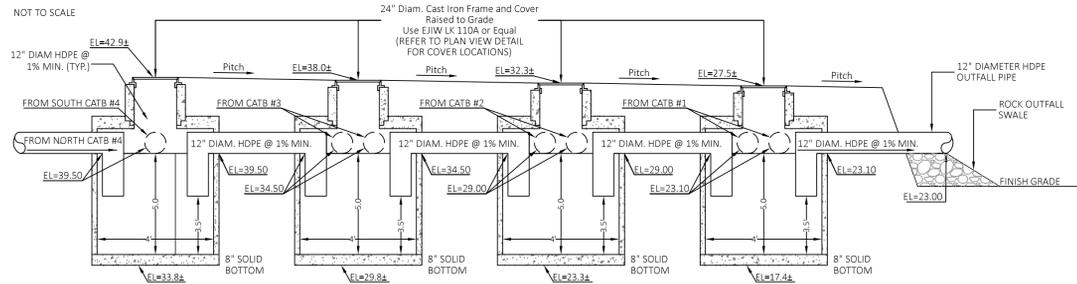
**PROPOSED SOLID 4-FOOT DIA. MANHOLE #4**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #4 (SOUTH)**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**FLOW PROFILE OF SOLID MANHOLES #1 - #4 AND OUTFALL PIPE**



**PROPOSED SOLID 4-FOOT DIA. MANHOLE #4**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. MANHOLE #3**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

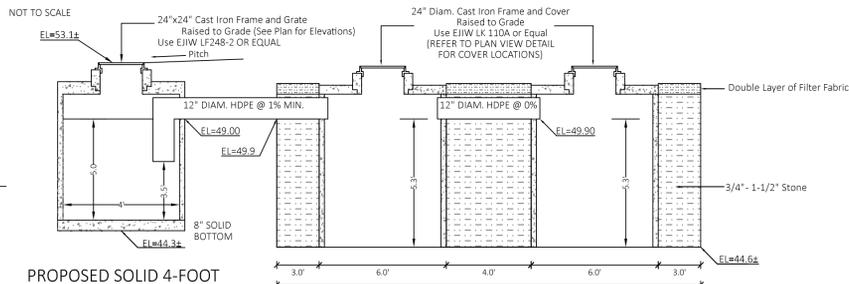
**PROPOSED SOLID 4-FOOT DIA. MANHOLE #2**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. MANHOLE #1**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**FLOW PROFILE OF DRAINAGE FACILITIES #2 & 3**



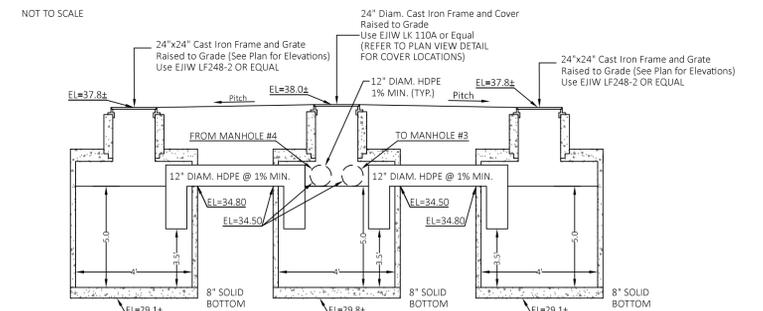
**PROPOSED SOLID 4-FOOT DIA. MANHOLES (CATCH BASIN #5)**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED LEACHING FACILITY**

USE TWO (2) 1000 GALLON PRECAST LEACHING PIT UNITS H-20 RATED UNITS AS MFG. BY SHOREY PRECAST OR EQUAL

**FLOW PROFILE OF CATCH BASINS & MANHOLE #3**



**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #3**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

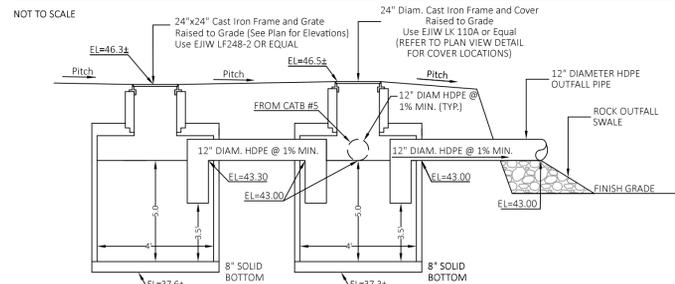
**PROPOSED SOLID 4-FOOT DIA. MANHOLE #3**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #3**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**FLOW PROFILE OF SOLID CATCH BASIN #5 MANHOLE AND OUTFALL PIPE**



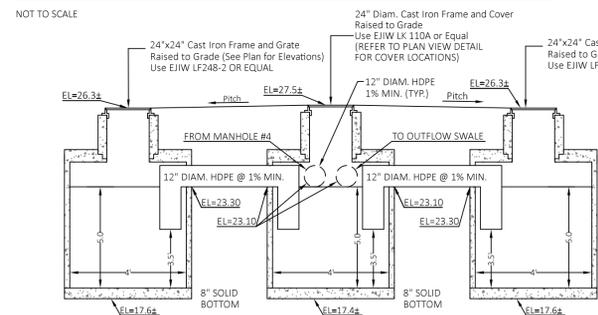
**TWO (2) PROPOSED SOLID 4-FOOT DIA. MANHOLE (CATCH BASIN #6)**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. MANHOLE #6**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**FLOW PROFILE OF CATCH BASINS & MANHOLE #1**



**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #1**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

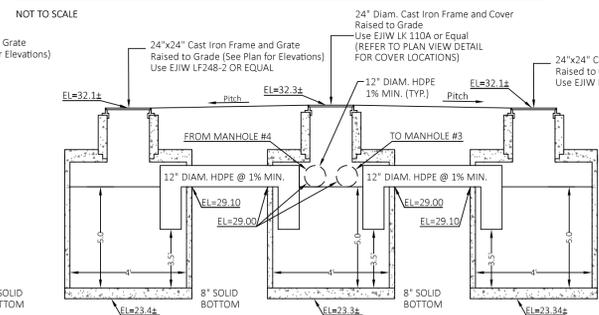
**PROPOSED SOLID 4-FOOT DIA. MANHOLE #1**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #1**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**FLOW PROFILE OF CATCH BASINS & MANHOLE #2**



**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #2**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. MANHOLE #2**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED

**PROPOSED SOLID 4-FOOT DIA. CATCH BASIN #2**

USE SOLID CATCH BASIN WITH BOTTOM AS MFG. BY SHOREY OR EQUAL 5-FOOT SUMP BELOW INVERT IS REQUIRED



**SHEET 4 OF 6**  
**PERMIT SET - NOT FOR CONSTRUCTION**

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**CLOVERLEAF TRURO RENTAL HOUSING**  
Community Housing Resource, Inc.; P.O. Box 1015, Provincetown, MA 02657

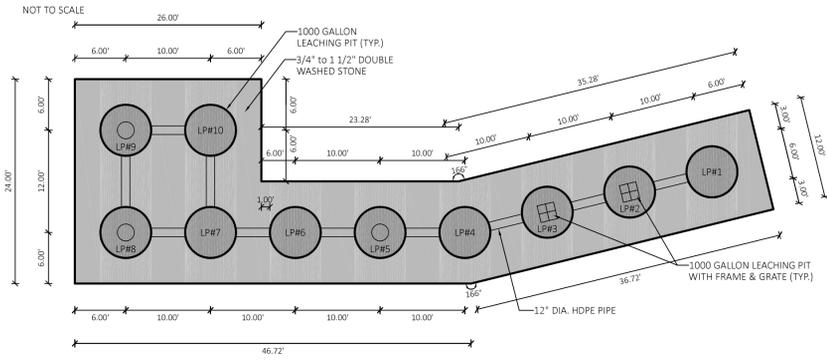
**SITE DETAILS - 40B PERMIT SET**  
22 HIGHLAND ROAD, TRURO, MA

**J.M. O'REILLY & ASSOCIATES, INC.**  
Professional Engineering & Land Surveying Services

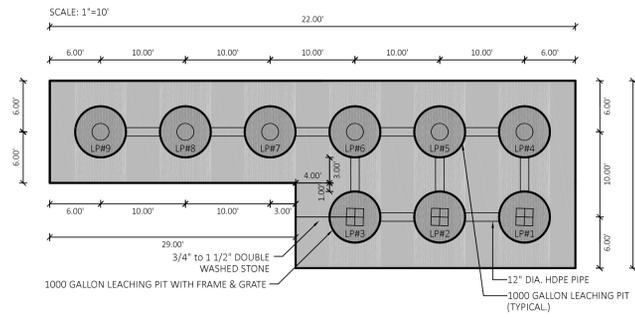
1573 Main Street - Route 6A  
P.O. Box 1773  
Brewster, MA 02631 (508)896-6602 Fax

DATE:	SCALE:	CHECK:	BY:	JOB NUMBER:
11-1-2019	As Noted	RRR	JMO	JMO-8446A

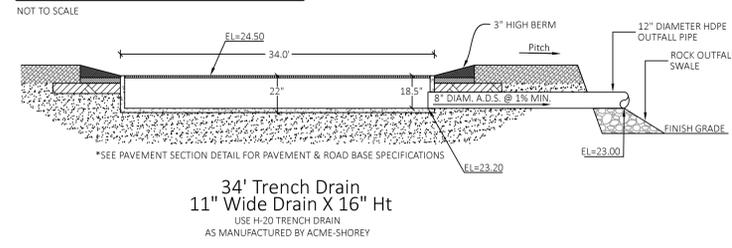
**FLOW PROFILE OF DRAINAGE FACILITY #4**



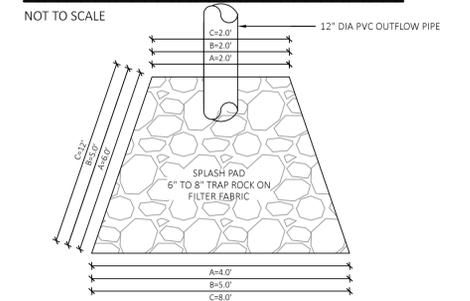
**LEACHING FACILITY #1**



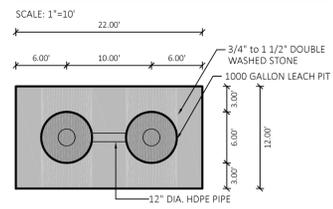
**DETAIL OF TRENCH DRAIN:**



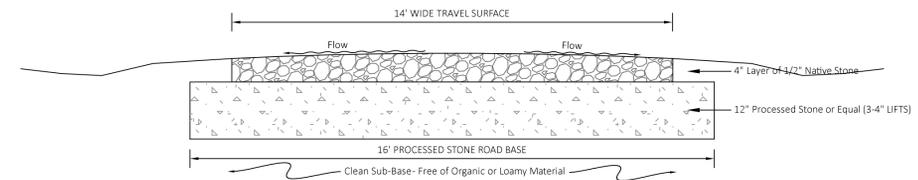
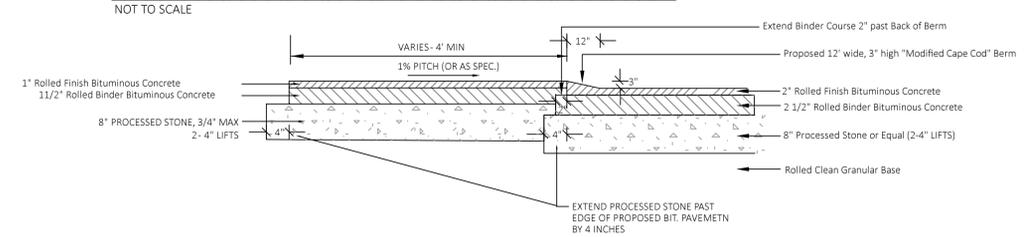
**RIP-RAP DETAIL FOR OUTFALL PIPE:**



**LEACHING FACILITIES #2 & #3**



**SIDEWALK SECTION FOR MODIFIED CAPE COD BERM**

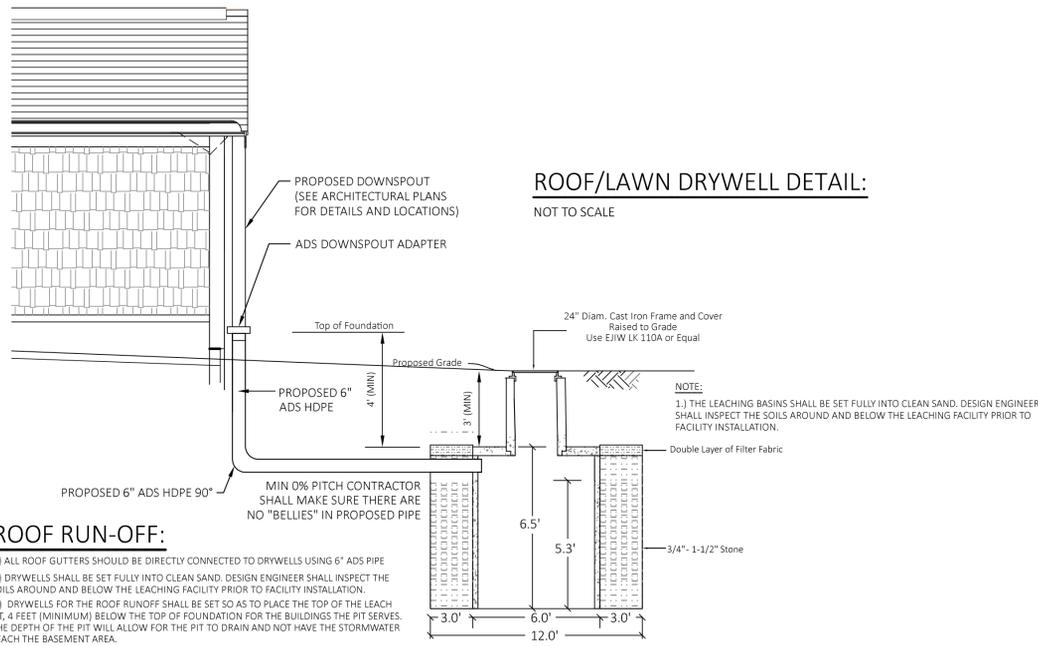


**EMERGENCY ACCESS DRIVE SECTION**

NOT TO SCALE

**ROOF/LAWN DRYWELL DETAIL:**

NOT TO SCALE



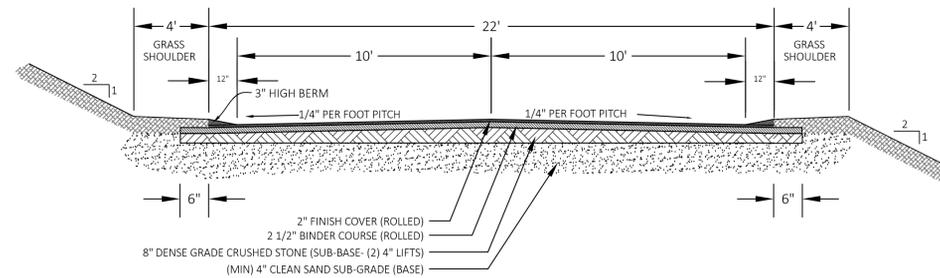
**ROOF RUN-OFF:**

- 1.) ALL ROOF GUTTERS SHOULD BE DIRECTLY CONNECTED TO DRYWELLS USING 6" ADS PIPE
- 2.) DRYWELLS SHALL BE SET FULLY INTO CLEAN SAND. DESIGN ENGINEER SHALL INSPECT THE SOILS AROUND AND BELOW THE LEACHING FACILITY PRIOR TO FACILITY INSTALLATION.
- 3.) DRYWELLS FOR THE ROOF RUN-OFF SHALL BE SET SO AS TO PLACE THE TOP OF THE LEACH PIT, 4 FEET (MINIMUM) BELOW THE TOP OF FOUNDATION FOR THE BUILDINGS THE PIT SERVES. THE DEPTH OF THE PIT WILL ALLOW FOR THE PIT TO DRAIN AND NOT HAVE THE STORMWATER REACH THE BASEMENT AREA.



**DRIVEWAY PAVEMENT SECTION (WITH CROWN):**

NOT TO SCALE



**PAVEMENT NOTE:**  
IN AREAS OF THE CENTER COURT AND BUILDING #21, THE PAVEMENT IS NOT CROWNED BUT SUPER-ELEVATED SO AS TO PUSH THE WATER TOWARDS THE RECEIVING CATCH BASINS.



SHEET 5 OF 6

PERMIT SET - NOT FOR CONSTRUCTION

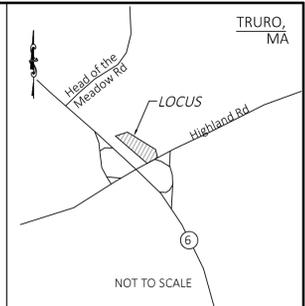
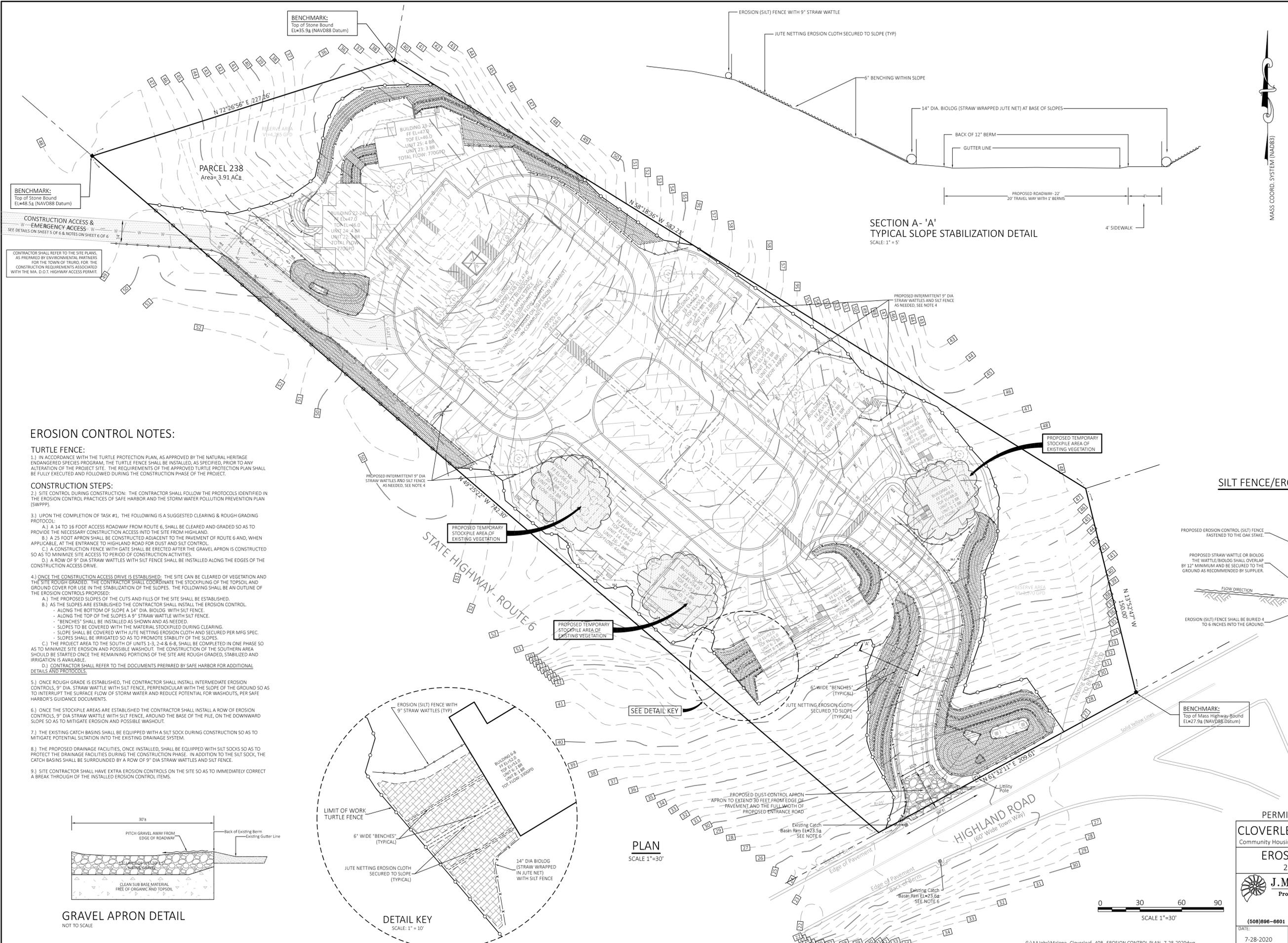
REVISED 7-28-2020: ADJUSTED SEWAGE SYSTEM AND DRAINAGE FACILITIES AS REQUESTED THROUGH THE PEER REVIEW. MODIFIED SWALE AND DRAINAGE FACILITIES; MODIFIED NOTES ON SHEETS 3 TO 5, ACCORDINGLY.  
REVISED 6-5-2020: UPDATED SEWAGE SYSTEM TREATMENT TO INCLUDE 10 PPM NITROGEN LIMIT; ADJUSTED SEWER MANHOLE LAYOUT; ADJUSTED DRAINAGE TO INCLUDE SWALES AND ADDITIONAL CONTRIBUTORY AREAS; UPDATED NOTES AND DETAILS ACCORDINGLY  
REVISED 2-14-2020: UPDATED BUILDING LAYOUT, ADJUSTED ENTRANCE; UPDATED SEWAGE SYSTEM COLLECTION AND ADDED I.A. TREATMENT TECHNOLOGY; UPDATED WATER SERVICE LAYOUT AND DRAINAGE ACCORDINGLY

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DATE: 11-1-2019 SCALE: As Noted BY: RFR CHECK: JMO JOB NUMBER: JMO-8446A



PLAN BOOK 672 PAGE 34  
 ASSESSORS' MAP 36 PARCEL 238

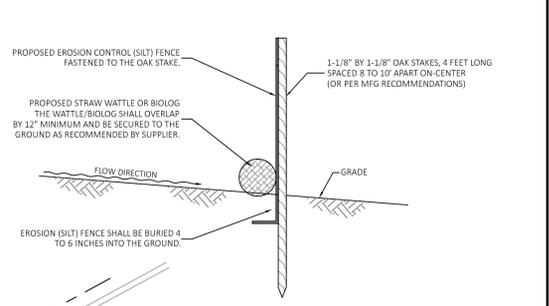
**LEGEND**

— 22	EXISTING CONTOUR
— 32	PROPOSED CONTOUR
x12.34	EXISTING SPOT GRADE
24x5	PROPOSED SPOT GRADE
W	WATER SERVICE LINE
E	UNDERGROUND UTILITY SERVICE
G	GAS SERVICE LINE
⊙	TEST HOLE / BORING LOCATION
ST	SEPTIC TANK
DB	DISTRIBUTION BOX
SAS	SOIL ABSORPTION SYSTEM
Reserve	RESERVED FOR FUTURE
U	UTILITY POLE
CB	CATCH BASIN
FH	FIRE HYDRANT
W	WELL
DM	DRAINAGE MANHOLE
■	CONCRETE BOUND, FOUND
—	TOP OF BANK

**EROSION CONTROL KEY**

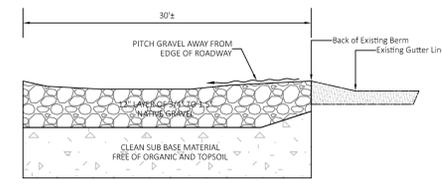
—○—○—	LIMIT OF WORK
—○—○—	TURTLE FENCE
—○—○—	EROSION (SILT) FENCE & 9" STRAW WATTLE
—x—x—	EROSION (SILT) FENCE & 14" DIA BIOLOG
—○—○—	6" WIDE "BENCHES" FOR BREAK IN SLOPE
■	EROSION CONTROL BLANKETS

**SILT FENCE/EROSION CONTROL DETAIL:**  
 TYPICAL SECTION

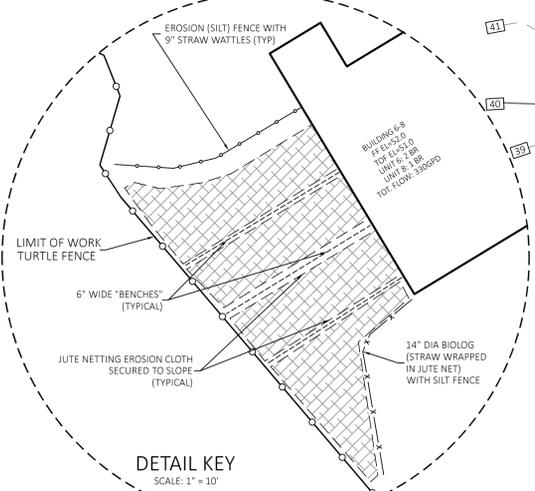


**EROSION CONTROL NOTES:**

- TURTLE FENCE:**
- IN ACCORDANCE WITH THE TURTLE PROTECTION PLAN, AS APPROVED BY THE NATURAL HERITAGE ENDANGERED SPECIES PROGRAM, THE TURTLE FENCE SHALL BE INSTALLED, AS SPECIFIED, PRIOR TO ANY ALTERATION OF THE PROJECT SITE. THE REQUIREMENTS OF THE APPROVED TURTLE PROTECTION PLAN SHALL BE FULLY EXECUTED AND FOLLOWED DURING THE CONSTRUCTION PHASE OF THE PROJECT.
- CONSTRUCTION STEPS:**
- SITE CONTROL DURING CONSTRUCTION: THE CONTRACTOR SHALL FOLLOW THE PROTOCOLS IDENTIFIED IN THE EROSION CONTROL PRACTICES OF SAFE HARBOR AND THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
  - UPON THE COMPLETION OF TASK #1, THE FOLLOWING IS A SUGGESTED CLEARING & ROUGH GRADING PROTOCOL:
    - A 14 TO 16 FOOT ACCESS ROADWAY FROM ROUTE 6, SHALL BE CLEARED AND GRADED SO AS TO PROVIDE THE NECESSARY CONSTRUCTION ACCESS INTO THE SITE FROM HIGHLAND.
    - A 25 FOOT APRON SHALL BE CONSTRUCTED ADJACENT TO THE PAVEMENT OF ROUTE 6 AND, WHEN APPLICABLE, AT THE ENTRANCE TO HIGHLAND ROAD FOR DUST AND SILT CONTROL.
    - A CONSTRUCTION FENCE WITH GATE SHALL BE ERECTED AFTER THE GRAVEL APRON IS CONSTRUCTED SO AS TO MINIMIZE SITE ACCESS TO PERIOD OF CONSTRUCTION ACTIVITIES.
    - A ROW OF 9" DIA STRAW WATTLES WITH SILT FENCE SHALL BE INSTALLED ALONG THE EDGES OF THE CONSTRUCTION ACCESS DRIVE.
  - ONCE THE CONSTRUCTION ACCESS DRIVE IS ESTABLISHED, THE SITE CAN BE CLEARED OF VEGETATION AND THE SITE ROUGH GRADED. THE CONTRACTOR SHALL COORDINATE THE STOCKPILING OF THE TOPSOIL AND GROUND COVER FOR USE IN THE STABILIZATION OF THE SLOPES. THE FOLLOWING SHALL BE AN OUTLINE OF THE EROSION CONTROLS PROPOSED:
    - THE PROPOSED SLOPES OF THE CUTS AND FILLS OF THE SITE SHALL BE ESTABLISHED.
    - AS THE SLOPES ARE ESTABLISHED THE CONTRACTOR SHALL INSTALL THE EROSION CONTROL:
      - ALONG THE BOTTOM OF SLOPE A 14" DIA. BIOLOG WITH SILT FENCE.
      - ALONG THE TOP OF THE SLOPE A 9" STRAW WATTLE WITH SILT FENCE.
      - "BENCHES" SHALL BE INSTALLED AS SHOWN AND AS NEEDED.
      - SLOPES TO BE COVERED WITH THE MATERIAL STOCKPILED DURING CLEARING.
      - SLOPE SHALL BE COVERED WITH JUTE NETTING EROSION CLOTH AND SECURED PER MFG SPEC.
      - SLOPES SHALL BE RIGATED SO AS TO PROMOTE STABILITY OF SLOPES.
    - THE PROJECT AREA TO THE SOUTH OF UNITS 1-3, 2-4 & 6-8, SHALL BE COMPLETED IN ONE PHASE SO AS TO MINIMIZE SITE EROSION AND POSSIBLE WASHOUT. THE CONSTRUCTION OF THE SOUTHERN AREA SHOULD BE STARTED ONCE THE REMAINING PORTIONS OF THE SITE ARE ROUGH GRADED, STABILIZED AND IRRIGATION IS AVAILABLE.
    - CONTRACTOR SHALL REFER TO THE DOCUMENTS PREPARED BY SAFE HARBOR FOR ADDITIONAL DETAILS AND PROTOCOLS.
  - ONCE ROUGH GRADE IS ESTABLISHED, THE CONTRACTOR SHALL INSTALL INTERMEDIATE EROSION CONTROLS, 9" DIA. STRAW WATTLE WITH SILT FENCE, PERPENDICULAR WITH THE SLOPE OF THE GROUND SO AS TO INTERRUPT THE SURFACE FLOW OF STORM WATER AND REDUCE POTENTIAL FOR WASHOUTS, PER SAFE HARBOR'S GUIDANCE DOCUMENTS.
  - ONCE THE STOCKPILE AREAS ARE ESTABLISHED THE CONTRACTOR SHALL INSTALL A ROW OF EROSION CONTROLS, 9" DIA STRAW WATTLE WITH SILT FENCE, AROUND THE BASE OF THE PILE, ON THE DOWNWARD SLOPE SO AS TO MITIGATE EROSION AND POSSIBLE WASHOUT.
  - THE EXISTING CATCH BASINS SHALL BE EQUIPPED WITH A SILT SOCK DURING CONSTRUCTION SO AS TO MITIGATE POTENTIAL SILTATION INTO THE EXISTING DRAINAGE SYSTEM.
  - THE PROPOSED DRAINAGE FACILITIES, ONCE INSTALLED, SHALL BE EQUIPPED WITH SILT SOCKS SO AS TO PROTECT THE DRAINAGE FACILITIES DURING THE CONSTRUCTION PHASE. IN ADDITION TO THE SILT SOCK, THE CATCH BASINS SHALL BE SURROUNDED BY A ROW OF 9" DIA STRAW WATTLES AND SILT FENCE.
  - SITE CONTRACTOR SHALL HAVE EXTRA EROSION CONTROLS ON THE SITE SO AS TO IMMEDIATELY CORRECT A BREAK THROUGH OF THE INSTALLED EROSION CONTROL ITEMS.

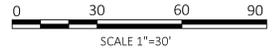


**GRAVEL APRON DETAIL**  
 NOT TO SCALE



**DETAIL KEY**  
 SCALE: 1" = 10'

**PLAN**  
 SCALE 1" = 30'



SHEET 6 OF 6  
 PERMIT SET - NOT FOR CONSTRUCTION

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**EROSION CONTROL SITE PLAN**  
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