ENERGY COMMITTEE REMOTE MEETING AGENDA

Monday, July 17, 2023, at 4:30pm

To Provide comment during the meeting please call in toll free at 1-877-309-2073

And enter the access code when prompted: 463-070-437

Or follow the link https://meet.goto.com/463070437

- Public Comment
- Discussion with Town Staff
  - DPW Director updates
  - Public Safety Building discussion
  - Annual Budgeting, Longer Term Capital Planning, Building Inventory
  - Vehicle Inventory
  - Solar Procurement
- DPW Study Group discussion
- Consideration of Minutes of prior meeting
- Local Comprehensive Plan update - WGA
- Climate Action Committee update
- Cape Light Compact, CVEC, Outer Cape Committees, Green Communities
- Net Metering Credits
- Specialized Energy Code education planning
- Passive House / Net Zero Carbon Construction & Education
- Building Codes, Net Zero Goals, State Agencies
- Large Projects updates
  - Town Facilities – Energy reduction plans & Solar
  - Landfills
  - Cloverleaf, Walsh Property, DPW
  - Other
- Solar Inventory and Adoption in Truro; Solarize update; Agrisolar
- Electric Vehicles Adoption
- MVP Action Grant and Microgrids; Truro Electric Grid
- Other issues from any members.
- Next Meeting Schedule

POWER EMERGENCY SHELTER, LOCAL RESILIENCE, AND GRID RELIABILITY WITH MICROGRIDS

Introduction:

In order for Truro to meet the challenges of climate change in an effective and equitable manner, the town must boost production of its own renewable energy, increase energy resilience and independence, and be able to provide emergency shelter for those most vulnerable in the community. Creating microgrid campuses on municipal land addresses all these considerations.

Microgrids provide local low-cost clean energy, enhance local resiliency, and improve the operation and stability of the regional electric grid. They provide dynamic responsiveness unprecedented for an energy resource[1]

Goal 1: Establish Microgrids at Various Truro Locations

The Truro Council on Aging (COA) and adjacent Truro Library form a campus that is a prime candidate for a microgrid**.** Both buildings, and their parking lots, offer abundant solar potential.

The Truro Central School (TCS), which already has an existing solar array, is another good candidate for a microgrid. The school could remain self-supporting or be expanded with additional solar. The school microgrid could be connected to the adjacent Walsh property, or go even further to the Public Safety Facility (PSF), which is 0.5 miles from the school.
The COA or Truro Central school could easily be adapted for Emergency shelter

The development of the Walsh property–in isolation, or in tandem with TCS or other town buildings–offers a unique platform for a community microgrid, similar to the one in Florida that weathered Hurricane Ian without power loss.[2]

The PSF microgrid location, if combined with solar generation and storage at the "burn dump" on South Highland Rd, could maintain critical loads for emergency services at the PSF, including minimal heating and cooling, computers and dispatch. The burn dump is 0.5 miles from the PSF.

Implementation:

- Complete a solar survey for all municipal roofs, parking lots, and open land. Include procurement options, initial and long-term costs. Include maintenance cost, ROI and payback period.

- Consider the 30% direct pay option to municipalities in the Inflation Reduction act to determine the most fiscally advantageous ownership model, Town or 3rd party ownership Note; the IRA direct pay option could be 40% for the transfer station and burn dump brownfield sites

- Use initial cost to the Town, ROI and payback period to prioritize the order for projects to be implemented.
- Coordinate adding solar to municipal buildings with the end of roof service life or when the roof age/IRA ITC expiration date make it cost effective.

- Parking lot canopies could be installed at any time

- Consider structuring a microgrid as Energy-as-a-service (EEaS)[3] or Microgrid-as-a-service (MaaS)[4] for any option selected. These are two ways to sidestep some of the roadblocks and defray, minimize or eliminate upfront cost to the town

Goal 2: Provide Emergency Shelter

Currently during a large scale and/or long duration power outage, Truro residents who need shelter must travel 10 miles to Provincetown or 18 miles to Nauset Regional High school in Eastham. This assumes that roads are passable, not buried in snow or flooded. Increasing summer temperatures that endanger the elderly and very young might also make emergency shelters valuable during heat waves for those who don't have air conditioning, or in the event of a grid failure.

The Council on Aging and the Truro Central School are excellent potential locations for emergency shelters in central Truro. Both buildings already have backup generators and large interior spaces where hundreds of residents could gather. If one or both building were part of microgrid systems and had the ability to island during power outages, the town would be able to provide shelter and relief even if the connection between BESS and Truro were severed.

Implementation:

- Choose the location that best fits emergency shelter (6/25 Develop criteria)

Goal 3: Improve Resiliency of Through-Transmission to and from Provincetown

Eversource's Battery Electric Storage system (BESS) is a model regional microgrid that can potentially benefit Truro. According to Eversource, the BESS system can furnish backup power for 3 hours in the summer and 10 hours in the winter.[5] But that power must travel along a vulnerable stretch of road to reach most of Truro. Currently, power travels to and from Truro on Eversource's 13.1 Mile circuit 96. Circuit 96 includes a 2.5 miles tretch of teetering overhead lines along North Truro's Shore Rd., a low-lying section of road susceptible to wind and flooding risk. During a significant weather event like a nor'easter or hurricane, with multiple poles down and Shore Rd flooded, BESS backup power might never reach Truro.
[Pictures?]

Resilience and redundancy go hand in hand. Rather than an either/or approach, a both/and approach that allows additional renewable energy to be fed into the grid while also giving Truro subsections of Circuit 96 the ability to island, would enhance Circuit 96 as a whole. Undergrounding electrical wires along Shore Rd. would also protect the connection between BESS and Truro.

Undergrounding [6] Implementation:

- Work with all stakeholders to resolve sewage and water issues on Shore Road.

- Join diverse stakeholders–including the towns of Truro and Provincetown, along with DOT, Eversource, the phone and/or internet providers–to plan and coordinate any sewer and water infrastructure improvements with undergrounding Eversource distribution lines on Shore Road.

- Consider reconfiguring Eversource's main and branch feeders. These feeders diverge from Route 6 after the public safety facility.

- Coordinate with DOT, Eversource, and the phone and/or internet providers to undergrounding Eversource lines between the school/ Walsh property and the PSF when Route 6 is repaved.

Endnotes

1. https://www.districtenergy.org/microgrids/about-microgrids97/features
2. https://www.npr.org/2022/10/05/1126900340/florida-community-designed-weather-hurricane-ian-babcock-ranch-solar
3. https://www.rff.org/publications/issue-briefs/energy-service-business-model-expanding-deployment-low-carbon-technologies/
4. https://www.microgridknowledge.com/google-news-feed/article/11431200/microgrids-as-a-service-making-resilient-efficient-and-sustainable-energy-a-reality
5. https://www.capecodtimes.com/story/news/2022/12/13/provincetowns-new-battery-system-provides-backup-power-to-outer-cape/69697459007/
6. https://www.dominionenergy.com/projects-and-facilities/electric-projects/strategic-underground-program

TRURO MICROGRID PROJECT

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-

Endnotes

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2 https://www.npr.org/2022/10/05/1126900340/florida-community-designed-weather-hurricane-ian-babcock-ranch-solar

3 https://www.rff.org/publications/issue-briefs/energy-service-business-model-expanding-deployment-low-carbon-technologies/

4 https://www.microgridknowledge.com/google-news-feed/article/11431200/microgrids-as-a-service-making-resilient-efficient-and-sustainable-energy-a-reality

5 https://www.capecodtimes.com/story/news/2022/12/13/provincetowns-new-battery-system-provides-backup-power-to-outer-cape/69697459007/

To: Truro Select Board

From: Truro Energy Committee & Climate Action Committee

Date: November XX, 2022

Topic: Proposal for a Whole Government Approach

Addressing the effects of climate change in Truro requires a collaborative effort between Truro's municipal staff, elected officials, and boards and committees. Therefore, the Climate Action and Energy committees propose a Whole Government Approach to respond to the impact of climate change.

Whole Government Approach

The Town of Truro recognizes that effective climate leadership requires the integration of climate change mitigation and adaptation into daily operations, decision- making, and planning for our municipality. The Truro Town government is committed to taking the lead on implementation of this approach and the integration of climate change mitigation and adaptation throughout all Town Departments, boards, and committees and will focus on three specific areas to achieve this:

Governance
Integrate climate change mitigation and adaptation goals, metrics, and evaluation criteria into Town planning and administration, including staff and department training, evaluations, and budgeting.

Education
Work with educators, parents, students, the School Board, and the State to bring climate education curricula into schools and student activities.

Resilience
Prepare businesses and residents for the adverse impacts of climate change through education and preparedness planning.

Departmental Responsibilities
One of the first objectives is to align Town Departments' responsibilities with the goals of the Climate Action Plan and identify any areas where municipal activities may be in conflict with the goals of the Plan. This process will result in the incorporation of a climate strategy into the goals of every Town Department's operations and planning.

Select Board Values, Goals, and Objectives

Values: Openness and Transparency, Collaboration, Sustainability

Goals: Use long term and strategic planning to guarantee the future health and well-being of our community.

Objectives: #10 The Select Board will provide support to and collaborate with the Climate Action Committee and the Energy Committee on the goals of creating a Climate Action Plan for the Town of Truro, and researching the hiring of a Climate Action Agent, as well as to work with the Climate Action Committee to develop a policy memorandum that facilitates and guides progress in all relevant areas toward a "Net Zero Truro" by 2050, and will ask for updates at least twice per year.

Request

The CAC and the EC ask the Select Board to review the proposed "Whole Government Approach to Addressing the Impact of Climate Change" and charge municipal departments and managers to adopt the goals.

To: Members of the Truro Energy Committee

From: The DPW Study Group

Date: July 12, 2023

Re: Working Draft - Plan for DPW Campus at Town Hall Hill

The DPW Study Group is writing to request a review by the Energy Committee of our proposal for an alternative approach to the DPW, specifically on the site at Town Hall Hill. We are professionals connected to Truro with well over 100 years of combined relevant professional experience in engineering, architecture, facilities development, and hydrology. We have reviewed the numerous DPW-related documents and discussions, including the video of your last meeting where you discussed some aspects of the proposed new DPW facility with Town consultants from Weston & Sampson. https://reflect-trurotv.cablecast.tv/CablecastPublicSite/show/5839?channel=1

Based upon these, we were moved to develop a proposal for a DPW that meets the DPW's stated needs while also addressing the concerns expressed by community members over excessive, unexplained costs and potential adverse impacts.

We have joined together to develop what we believe is a constructive proposal for the DPW that gives the DPW everything it requested - and more - at about half the cost proposed to date. It will deliver a DPW that is smartly designed, solves multiple problems, eliminates many other problems, and will result in an energy-efficient, fully operational DPW that can be phased in and completed within two years after approval. And it can start soon, as there is no community opposition to the current site.

We have proposed energy measures that we hope to review with the Committee, to get your perspective on whether these meet the current and intended "energy" pathways the Committee espouses and to hear your suggestions for improvements, energy-wise. A key feature of our proposal focuses on "embodied energy" - the actual energy in existing structures – combined with state-of-the-art energy source and use features.

We have paid attention to W&S concept reports on the project, as well as others beginning with Mark Dickinson's summary analysis in his letter of Jan 5th, attached. Subsequently, all of us again reviewed the most recent Weston & Sampson documents and incorporated insights from other published information, aiming to meet the essential functional requirements expressed in the most recent report, dated March 8th. We have adopted the space and functional specifications requested by the DPW Director.

We have concluded that the existing Town Hall Hill site would be the least costly, the most effective functionally and in every other way reduce delay, contention in the community, and achieve the DPW requested in an more tax-affordable and easily-delivered package.

We have focused our analysis and proposal with a view toward reducing the cost of construction as well as ongoing operational costs, especially with respect to energy consumption. This is all with a view to

- Create a facility that will meet present and future needs of the DPW staff and the Truro community, especially as the transition from fossil-fuels to electrical power occurs.
- Re-develop the current site in phases so as not to disrupt existing operations.
- Gain significant additional space by moving the well to nearby Snow's Field to serve double-duty of providing potable water to Town Hall and the DPW while repurposing the current well for DPW's non-potable uses.
- Re-use 2 of existing structures for storage as a way to benefit from their embodied energy.

- Retain the existing fuel station and generator provide unique and significant cost efficiencies, and also eliminate environmental impacts and costs related to shutting down and removing a “gas station” and building a new one at another site.
- Gain additional costs and environmental benefits by including brine storage (rather than salt storage).
- Maintain an emergency services facility in and near South Central Truro to enhance timely response and reduce vulnerability of centralized emergency services in a catastrophic event.

There are many other functional, operational, environmental, and cost benefits we look forward to discussing with you.

We would like to review our Working Plan for the DPW Campus at Town Hall Hill with the Energy Committee to get your feedback - so much of the plan is premised on current and future energy features and concepts where you feedback is both germane and fundamental.

Thank you for your consideration.

Members of the DPW Study Group
Anthony Garrett
Jim Armstrong
Mark Dickinson
Kevin Kuechler

Encl: DDS letter / Jan 5, 2023

January 5, 2023 via email to tprta@tprta.org

TPRTA (Truro Part-Time Resident Taxpayers' Association)
PO Box 324
Truro MA 02666

Re: Proposed New DPW facility

Dear Board Members,

I am a retired commercial real estate developer, and my company Dickinson Development Corp, formerly based in Quincy MA, has developed over 3 million square feet of commercial/industrial space for private and public entities. For years I was a Truro taxpayer with a home in North Truro and still have family and friends in Truro, with strong contact and connection with Truro. Hopefully, my comments below are useful to you as a taxpayer matter.

I have reviewed all the publicly available plans, proposals, and clarifications submitted by Weston & Sampson (W&S), a Massachusetts-based engineering firm, regarding the proposed new facility for the Dept. of Public Works (DPW) in Truro, MA. I have also viewed public recordings of meetings where this project has been discussed. My focus here is on the plans concerning the current location of the DPW, presently located between Town Hall Rd and Meetinghouse Rd in Truro, also referred to as "Town Hall Hill" (THH).

Site Considerations

The plans for a new DPW facility now propose a 29,608 SF facility including 16,958 SF for covered vehicle storage and maintenance with recommendations apparently prioritizing alternate sites.

I see no reason for a move to a new location, assuming that the existing Zone I area of approximately 30,000 square feet (SF) becomes available for development when the potable water well is installed at nearby Snows Field[1]. The addition of that well on within-reach land makes a significant difference, making the project feasible and much more cost effective on the existing site.[2]

[1] A new well serviceable as a source of potable water to Town Hall.is required by the DEP and Snow's Field is the nearest Town-owned source. A new well at Snow's Field would eliminate the Zone I around the existing well on the current DPW site, making that well available for a non-potable water source for DPW operations and allowing greater use of 30,000 sf of open space for construction on that lot. I have assumed a new DEP-required well for THH will be placed at Snow's Field in any case, accordingly.
[2] The Truro Conservation Trust has adjacent land located between THH/DPW and Snow's Field. Given the environmentally sound goals of retaining DPW at THH, the Trust could be approached for an underground easement for piping, further reducing cost even more than referenced within this document.

Based on my years of experience developing commercial and industrial real estate, I am confident that it is possible to implement a program that stages construction in two or more phases. With the availability of the additional 30,000 SF +/- on the ground due to the elimination of the Zone I, the project can be phased with minimized disruption or temporary relocation.

Some Operating Cost Considerations

In any project, long term operating costs are a key consideration. The largest cost category is often energy. With the trend toward electrification and away from fossil fuels this means electrical costs become key.

The easiest way to reduce energy costs is by not "conditioning" (A/C) all areas of multi-purpose structures. In the case of a DPW on Cape Cod, storage buildings for non-freezing materials (e.g., salt, etc.) and vehicle areas, if any, do not need conditioning, sharply reducing electricity usage.

Unconditioned structures can also have more simplified construction, which in turn reduces capital costs of construction. For example, many DPWs, even in severe climate regions, use a "greenhouse" type of structure, which is significantly less expensive, more flexible and faster to construct. These are available from several manufacturers, such as ClearSpan and Big Top Shelters, to name just two.

With respect to conditioned structures, other ways of reducing operating costs include building tighter structures. This is especially advantageous to a municipality that has capital financing costs lower than typical private projects and may qualify for grants.

One specific aspect to note is an area for periodically washing vehicles. Truro has a milder maritime winter climate, and so an inside wash area for a small number of vehicles seems unnecessary and cost-prohibitive. Harvard University, for example, with an endowment and a fleet many times larger than Truro's and subject to a colder and snowier climate, utilizes an exterior wash area. In Truro's case, this would greatly reduce operating and capital costs as well as the mass of the complex.

The declining cost of solar panels and increasing cost of electricity from the grid makes it imperative to design solar rooftops where possible. A project such as this should be able to produce much of its own electricity. It should also have its own backup power source (e.g., battery or generator) so public services can continue to be delivered during power outages.

Summary

- The new DPW can be built at Town Hall Hill in phases.

- It will not require the DPW to fully vacate the site during construction.
- DPW services can continue with manageable interruption during construction.
- It should cost considerably less than currently projected, particularly if local contractors are used in construction.
- It keeps Town staff co-located, as it is currently, thereby fostering management efficiencies.
- For the DPW, the THH site allows for the least impact of all sites proposed in terms of
  - cost to taxpayers
  - benefit to THH facilities (Town Hall and DPW) by the most efficient and appropriate use of wells (i.e., splitting Zone I well/water source at Snow's Field for potable water and existing well water source at THH for non-potable utilitarian uses)
  - ease of ultimate use, without new construction of roads, adverse impacts on Route 6 corridor traffic, and known safety impacts
  - sharply reduced adverse environmental impacts resulting from no new contamination from salt or chemicals at presently uncontaminated sites under consideration
- A phased development can be aligned with the Town's ability to provide capital over time for various aspects of the project, by not requiring a "big bang" approach to renovations.
- The THH site allows for a phased development over time which enables proper energy design considerations to be employed so that the end result meets the Town's net zero goals. The energy footprints for human-occupied structures are significantly different than for storage facilities, which naturally encourages a segmented approach.
- Developing a DPW that meets real service requirements in a manner that is well-designed, efficient, and scaled to community needs and resources is best achieved by keeping the DPW at Town Hall Hill, developing a new well at Snow's Field, building in energy economies in building and use, and storing/washing vehicles outside. These steps, among others mentioned above, will significantly reduce construction costs and maintenance costs long-term. This is turn benefits taxpayers and is a win-win for the community.

Upon request, I can provide additional detail to elaborate on my experience and my opinion.

Respectfully submitted,

Mark Dickinson, President
Dickinson Development Corp
PO Box 359, Scituate, MA 02066

From: Anthony Garrett
Date: Sunday July 16, 2023 at 7:15 AM
To: Energy Committee
Subject: DPW Campus – For Discussion – Design Presentation & Basis of Design (BoD)
:
I attach two documents for review and discussion by the Energy Committee of a proposed DPW Campus:

- A slide presentation of the proposed DPW Campus at Town Hall Hill with site and building plans, green strategies, solar applications, projected costs, and more information
- A narrative "Basis of Design" that details underlying considerations

There is a lot in these documents but the most important points are:

- Five buildings, three new and two existing re-purposed and re-furbished
- Phased approach - no re-location needed
- Functions and feature needs of DPW incorporated from W+S reports, with 10% more space
- Proposed costs at about half of the current proposed figures, We estimate around $15.5 M ±
- Energy and other green features that are new for DPW. Our approach is based upon "embodied energy" – the energy that already exists in existing structures that can be saved by smart development – and by energy-saving steps that can be used in the entire process and in operations going forward

We look forward to discussing these with the Committee and appreciate the opportunity.

regards,

Anthony Garrett

BILOW GARRETT GROUP
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RIDGEFIELD PARK , NEW JERSEY
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CELL (201)321-0283
WWW.BILOWGARRETT.COM

DPW Campus Design – Town Hall Hill

Proposal by the DPW Study Group

- Basis of Design
- Site and Building Plans
- Costs
- Other Considerations

Developed by the DPW Study Group:
- Anthony Garrett, Architect
- Jim Armstrong, Facilities Development
- Mark Dickinson, FacilitiesDevelopment
- Kevin Kuechler, Hydrology

July 14, 2023

DPW Campus | Rationale

Background

- The Truro Community has watched the Town of Truro struggling to define a new DPW Plan for many years, especially in the past four years.

- A small group of volunteer experts with connections to Truro formed a "DPW Study Group" to explore alternatives to the rigid design being considered. Credentials include:
    - Licensed commercial architect with experience designing and building DPWs
    - Experienced commercial developer of complex properties
    - Experienced large-scale facilities manager
    - Water systems expert familiar with Truro water needs, operations, and options

- The result is "DPW Campus" which meets the requirements stated in the specifications in the proposals of Weston & Sampson

- The result is *improved, bigger, significantly cheaper, safer, and faster to implement than the proposed Public Safety Facility site.*

DPW Requirements

From Weston & Sampson Report - 8 Mar 2023

W&S Specs

Space Needs Assessment	Rev 2
Office / Office Support	1,300 SF
Employee Facilities	1,700 SF
Workshops	2,900 SF
Vehicle Maintenance	5,400 SF
Wash Bay	1,350 SF
Vehicle & Equipment Storage	16,958 SF
TOTAL	**29,608 SF**

DPW Campus | Key Design Principles

- Take a step back and think creatively.
- Heed earlier Select Board request, which asked if existing structures could be reused and/or repurposed
- Use the existing site as much as possible, working with the grade
- Employ a more pleasing and practical campus-like design to foster reuse and phased construction
- Design to be architecturally compatible with Town Hall
- Design for future needs with trends in mind, to avoid future added costs
- Maintain existing operations while improving the facility
- See separate *Basis of Design* document for additional detail and information

DPW Campus | Key Design Features

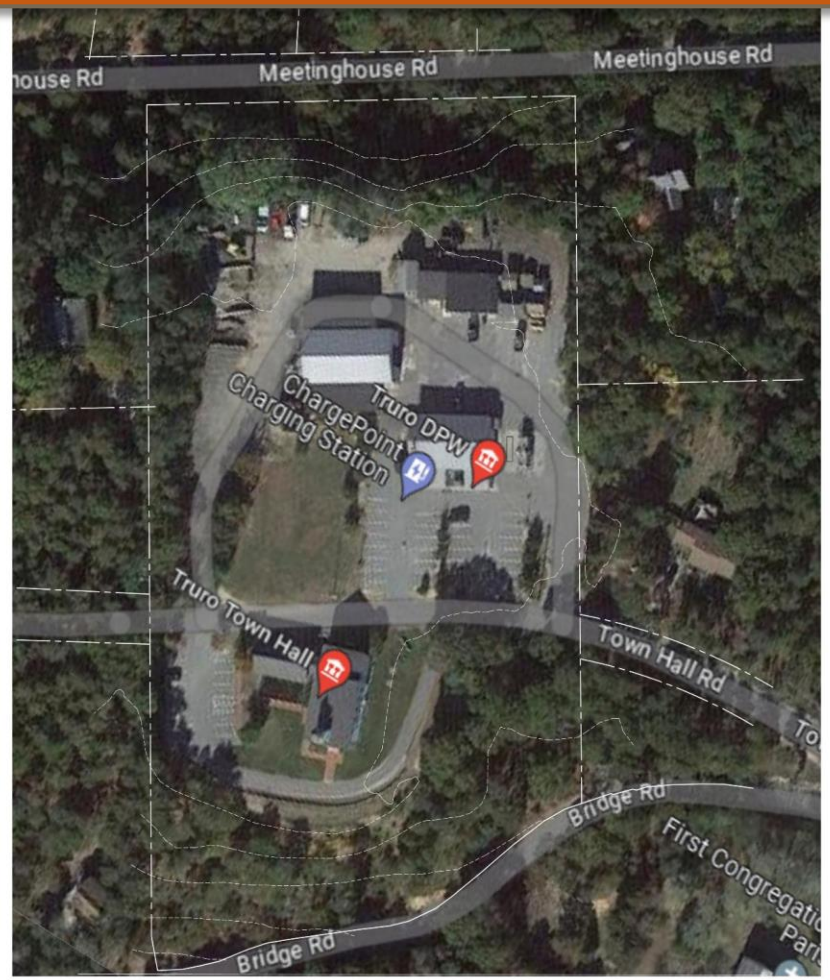
- *IMPROVED*
  - Energy efficient design with smaller carbon footprint and solar power generation
  - No incremental environmental concerns; no fuel station move required
  - Resolves Town Hall Hill potable water issue outstanding
  - Allows for future transition from salt to brine
  - Follows principles of Distributed Emergency Resources in Catastrophic Events; keeps the only emergency services near South Truro, diversifying response geographically and grid-wise
- *BIGGER*
  - 10% more useable space than W&S requirements
  - More office space and storage space; provides opportunities for shared space with Town Hall
- *CHEAPER*
  - Approximately one-half the cost of current proposed design. More acceptable to taxpayers
  - Unique to Town Hall Hill due to existing structures, environmental impacts, shared well, and siting options
- *SAFER*
  - No adverse, unknown or new traffic, safety or environmental impacts
- *FASTER*
  - Phase 1 of the plan could begin construction without further delay
  - No "change of use" required, no community opposition

DPW Campus | Phased Construction Plan

- Enables operations to continue without interruption
- No temporary DPW facilities required
- Reuses and where needed refurbishes major cost items:
  - Two existing buildings
  - Generator
  - Fuel Station
- Efficient phased construction and/or installation of three new buildings
- The phases are:
  - First two (2) buildings can be constructed while the current buildings remain occupied
  - Upon completion of Buildings 1 and 2, the current operations can be relocated into these buildings, enabling the demolition of the obsolete structures
  - This frees up the north end of the site for remaining construction
  - This will allow for operations at the site to continue without interruption, to begin immediately upon voter approval and for capital outlays to be staggered

Existing Conditions | DPW Facility

Sheet 1



EXISTING CONDITIONS SITE PLAN

SCALE: 1" = 40.0'

NORTH

(IN FEET)
1" = 40'-0"

PROPOSED CAMPUS FOR THE
TOWN OF TRURO
DEPARTMENT OF PUBLIC WORKS
TOWN HALL ROAD
TRURO, MASSACHUSETTS

BLOW GARRETT GROUP
ARCHITECTS AND PLANNERS, P.C.
161 MAIN ST. • RIDGEFIELD PARK, NJ 07660
(201) 807-0407 • FAX (201) 807-0551

EXISTING CONDITIONS SITE PLAN

DRAWING NUMBER
EX-SP-100

Existing Conditions | DPW Facility | Photo Elevations


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PHOTO SCHEDULE

PHOTO NUMBER	DESCRIPTION
1	EXISTING ENTRANCE AT S.E. CORNER AND FUEL STATION
2	WORKSHOP BUILDING, SOUTH & EAST ELEVATION
3	ADMINISTRATION BUILDING SOUTH ELEVATION
4	SALT BAND EAST ELEVATION
5	FENCE AT N.E. CORNER OF PROPERTIES
6	NORTH END OF PROPERTY, (DROP OFF IN TOPOGRAPHY)
7	NORTH ELEVATION OF SALT BARN
8	WEST END OF PROPERTY
9	NORTHWEST CORNER OF PROPERTY
10	TOWN HALL
11	SOUTH ELEVATION OF SALT BARN
12	WORKSHOP BUILDING SOUTH & WEST ELEVATION
13	SOUTH ELEVATION OF WORKSHOP BUILDING WITH GENERATOR
14	TOWN HALL ROAD LOOKING WEST

14 JULY 2023
ISSUED & REVISIONS

PROPOSED CAMPUS FOR THE
TOWN OF TRURO
DEPARTMENT OF PUBLIC WORKS
TOWN HALL ROAD
TRURO, MASSACHUSETTS

BILOW GARRETT GROUP
ARCHITECTS AND PLANNERS, P.C.
161 MAIN ST. • RIDGEFIELD PARK, NJ 07660
(201) 807-0407 • FAX (201) 807-0513
DAVID N. BILOW NJ AI 5839 NY 10029
ANTHONY GARRETT NJ AI 14246 NY 22214
MA#52749

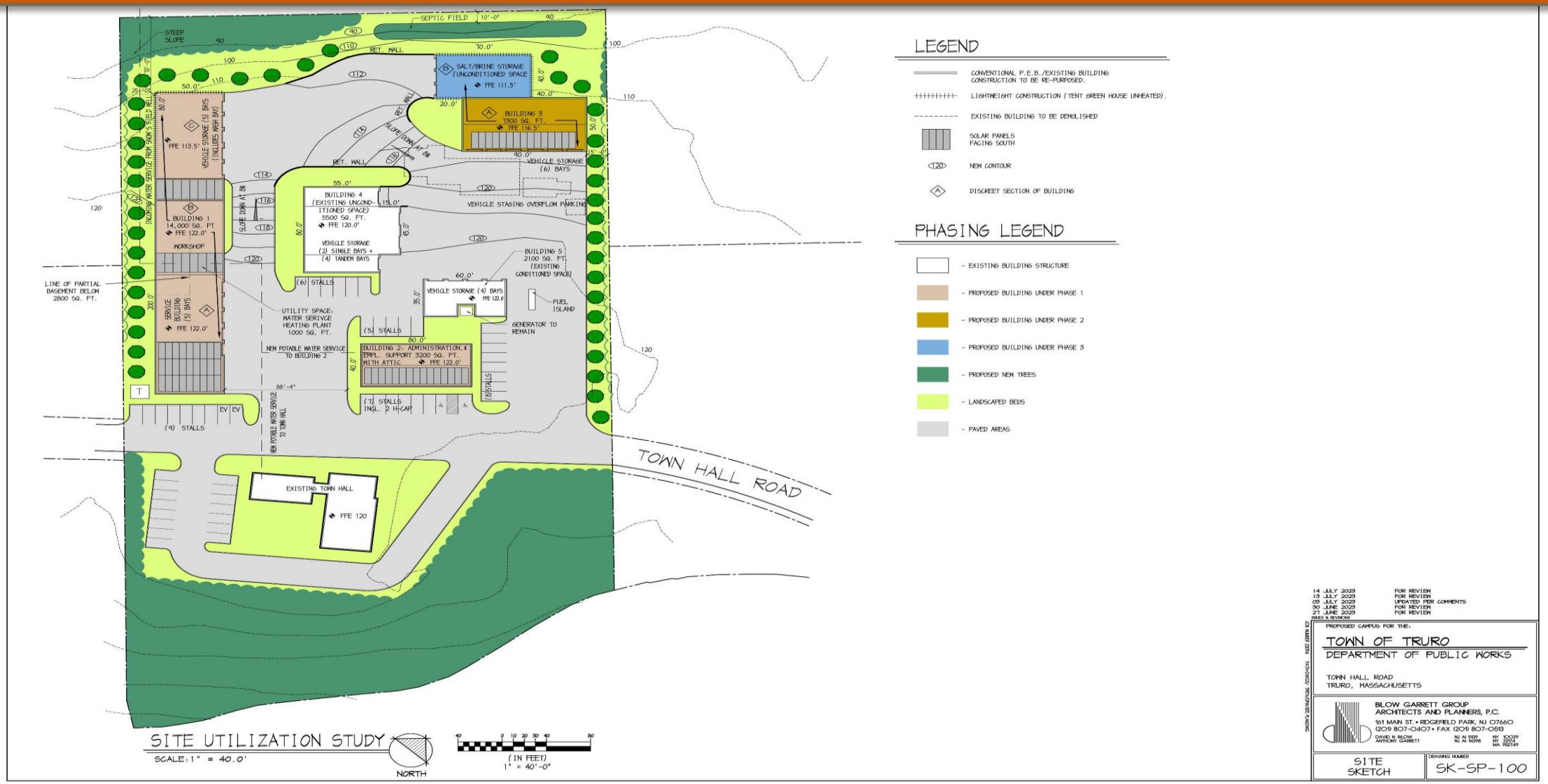
PHOTO ELEVATIONS EXISTING CONDITIONS
DRAWING NUMBER SKE-100

Comparison of Facilities Specifications

W&S (8 Mar 2023) vs DPW Campus (14 July 2023)

BOTH PLANS	W&S	DPW CAMPUS		NET CHANGE
Building Functions	SF	Bldg	SF	(- is less)
Office / Office Support	1,300	2	2,700	1,400
Employee Facilities	1,700	2	3,500	1,800
Workshops	2,900	1B	4,350	1,450
Vehicle Maintenance	5,400	1A	5,950	550
Wash Bay	1,350	1C	1,350	0
Vehicle & Equip Storage	16,958	several	14,750	-2,208
TOTALS	29,608		32,600	+2,992 +10%

DPW Campus | Site Overview



LEGEND

- CONVENTIONAL P.E.B./EXISTING BUILDING CONSTRUCTION TO BE RE-PURPOSED.
- LIGHTWEIGHT CONSTRUCTION (TENT GREEN HOUSE UNHEATED).
- EXISTING BUILDING TO BE DEMOLISHED
- SOLAR PANELS FACING SOUTH
- 120 NEW CONTOUR
- A DISCREET SECTION OF BUILDING

PHASING LEGEND

- EXISTING BUILDING STRUCTURE
- PROPOSED BUILDING UNDER PHASE 1
- PROPOSED BUILDING UNDER PHASE 2
- PROPOSED BUILDING UNDER PHASE 3
- PROPOSED NEW TREES
- LANDSCAPED BEDS
- PAVED AREAS

14 JULY 2023 FOR REVIEW
13 JULY 2023 FOR REVIEW
09 JULY 2023 UPDATED PER COMMENTS
30 JUNE 2023 FOR REVIEW
21 JUNE 2023 FOR REVIEW
ISSUES & REVISIONS

PROPOSED CAMPUS FOR THE:

TOWN OF TRURO
DEPARTMENT OF PUBLIC WORKS

TOWN HALL ROAD
TRURO, MASSACHUSETTS

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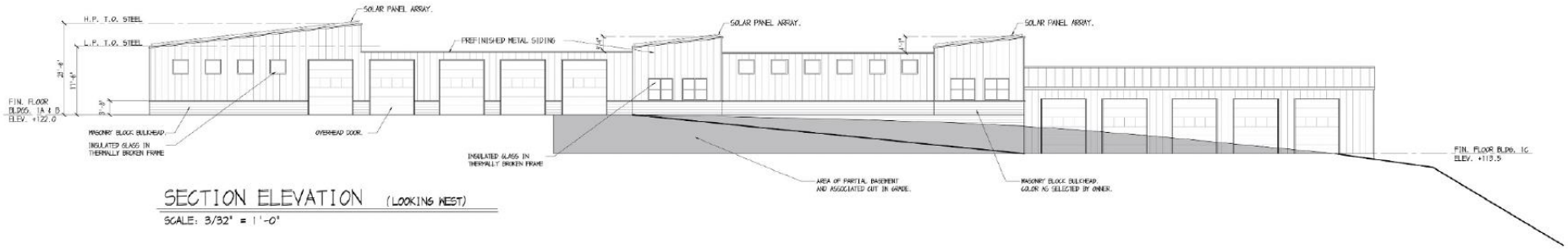
SITE SKETCH

DRAWING NUMBER SK-SP-100

DPW Campus | Site Elevations

Bldg 1A **Bldg 1B** **Bldg 1C**

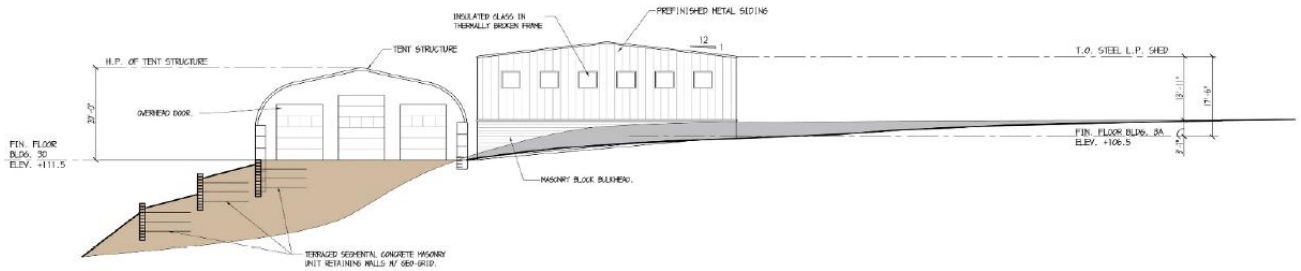


SECTION ELEVATION (LOOKING WEST)

SCALE: 3/32" = 1'-0"

Bldg 3A **Bldg 3C**

Bldg 2 on separate sketch



SECTION ELEVATION (LOOKING EAST)

SCALE: 3/32" = 1'-0"

LEGEND

- AREA TO BE CUT
- AREA TO BE FILLED

GRAPHIC SCALE

(IN FEET)

3/32" = 1'-0"

14 JULY 2023 FOR REVIEW

PROPOSED FACILITY FOR THE

TOWN OF TRURO

DEPARTMENT OF PUBLIC WORKS

TOWN HALL ROAD

TRURO, MASSACHUSETTS

BLOW GARRETT GROUP

ARCHITECTS AND PLANNERS, P.C.

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SECTION ELEVATION

DRAWING NUMBER SK-200

DPW Campus | Concept Design | Attributes

- Working with the existing topography eliminates construction of massive retaining walls
- Utilizing current building footprints and foundations follows the overall characteristics of the site
- Repositioning the existing buildings for appropriate uses to recapture the embodied energy embedded in these structures while minimizing investment costs for these facilities, thus reducing costs
- Repurposing the existing infrastructure including fueling station, generator
- The new structures are proposed as Pre-Engineered Building structures (PEB), to eliminate excess labor and materials costs, thus reducing costs associated with construction and installation
- Providing potable water supply to both the new DPW Facility and Town Hall
- Inclusion of basement space where appropriate to work with the grades provides improved structural support and improved functionality such as:
    - Collection of oils from vehicles during maintenance
    - Overflow records storage for Town Hall
- Recommended shift to brine eliminates a salt storage unit, introduces safer storage and use, significantly reduces construction and ongoing operational costs, is environmentally better
- Many other design benefits, as noted in Basis of Design document

DPW Campus | Green Strategies

- Use of Renewable Energy - Solar Power
- Improved thermal envelopes on new buildings that are conditioned
- Daylighting integrated into a lighting control system to reduce Energy Consumption
- Roofs to have a Solar Reflective Index (SRI) of 78
- Use of demand Response Ventilation in buildings with limited occupancy to reduce Energy Consumption
- Employing ventilation and air movement in lieu of full HVAC in appropriate locations, utilizing large-scale destratification fans for improved air circulation
- Integration of appropriate facets of “Passive House” features per the Energy Code
- Eliminating expensive HVAC systems in the vehicle storage areas
- Repurposing two existing buildings to recapture their Embodied Energy
- Repurposing the existing non-potable water/well on-site for
    - Vehicle and equipment washing
    - Flushing of toilets
    - Campus road and building surface clean-up
    - Other service sinks/hose bibbs in the facility not requiring potable water.

DPW Campus | Green Strategies | Benefits

Pursuing green building strategies, including Passive House Design, will result in these added benefits:

- Reduce carbon footprint
- Approach and achieve Net Zero Energy Consumption
- Reduce adverse environmental, safety and traffic impacts at this site and avoid new impacts on currently undeveloped land
- Save on hard and soft costs of operations, maintenance and other impacts
- Generate revenues from solar power to reduce NET costs for DPW

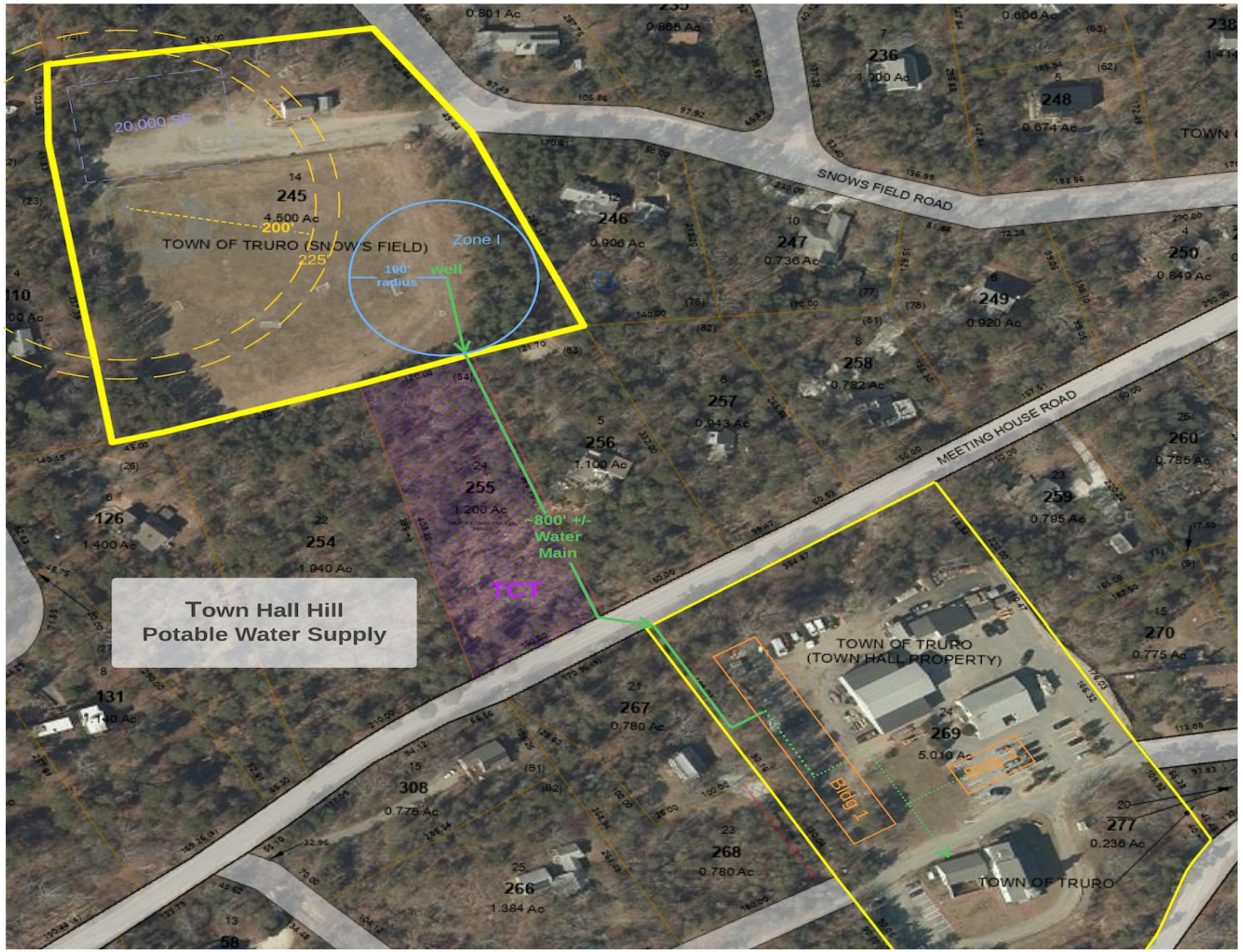
DPW Campus | Water Supply

New Well, Existing Well & Water Supply

Snow's Field

Blue - Zone 1 Protection Area (Well)

Green –Water Main to DPW and Town Hall (underground) **under TCT land** (purple)



Well Head - small above-ground unit at center of circle

DPW Campus Site
Orange – New Bldgs

Town Hall receives potable water

DPW Campus | Project Costs | Summary

Buildings x Function	Bldg	Total SF	Cost Total
Office / Office Support	2	2,700	$1,426,480
Employee Facilities	2	3,500	$1,838,760
Workshops	1B	4,350	$2,829,530
Vehicle Maintenance	1A	5,950	$4,795,780
Wash Bay	1C	1,350	$185,625
Vehicle & Equip Storage	several	14,750	$2,233,000
Fuel Station (unchanged)	n/a	-	$0
*Salt/Brine Storage**	*3B*	*2,800*	*$308,000*
Buildings Total *excl. salt/brine*		32,600	13,309,175
Non-Building			
Site	est		$1,100,000
Non-potable water well	est		$55,000
Subtotal DPW Cost			**$14,464,175**
Contingency		6%	$867,851
Total DPW Cost			**$15,332,026**
Town Hall - Shared Infrastructure			
Snow's Field - Well + piping	est		$210,000
Total Cost w/ Town Hall			**$15,542,026**

**Significantly less If switching to brine (recommended); NOT in calcs*

DPW Campus | Solar Energy Plan

SOLAR PLAN DETAILS		Solar	Solar	Solar	Solar
Function	Bldg	Width	Length	Sq Ft	kW
Office / Office Support	2	26.1	80	2088	41.8
Workshops - S end	1B	20.6	50	1031	20.6
Workshops - N end	1B	20.6	50	1031	20.6
Vehicle Maintenance Garage	1A	46.4	50	2319	46.4
Vehicle & Equipment Storage	3A	20.0	80	1600	32.0
Vehicle & Equipment Storage	5	15.8	55	870	17.4
	Watts/SF		**Totals**	8938	178.8
	20				
				Generation - Hrs/Yr	1300
				MWh/yr	232
				$/MWh	$250
			Earned Revs/Yr	**$58,100**	

DPW Campus | Solar Generated | Revenues

SOLAR ECONOMICS

Annual Earnings **$58,100**

Years of Impact	**Scenario**	**A**	**B**
Years of Operation (est)		25	50
Years to Payback Investment		4	4
Earning Years of Generation		21	46

DPW Costs w/Solar Revenues	**Scenario**	**A**	**B**
Total Earnings ($ in millions)		$1.22	$2.67
DPW Costs		$15.3	$15.3

DPW Costs | Net Solar Earnings **$14.1** **$12.7**

The DPW Study Group | Volunteer Members

Biographies

- **Anthony Garrett, AIA, LEED AP BD+C, PP** has nearly 40 years' experience in architecture design, construction management and city planning. He has been a partner at Billow Garrett since 1999, a firm that has designed and developed many DPW facilities. Licensed as an architect in many states including MA, he has served as Planning Board Chairman in Boonton, NJ, serves on the Design Review Committee in Montville, NJ, and is the President of the Truro Part-Time Resident Taxpayers Association (TPRTA) in MA. He holds a Bachelor's degree from Rensselaer Polytechnic Institute. He is part owner of the Green Bay Packers.
- **Jim Armstrong** has nearly 40 years' experience in commercial facilities development for Texas Instruments (TI). He rose to Vice President of Operations within TI, a role he held for more than 13 years. He has developed complex facilities involving millions of square feet structurally located in diverse terrains and settings, while managing equipment valued in the hundreds of millions and a team of 6,000 employees.
- **Mark Dickinson** is the founder of Dickinson Development, a firm specializing in development and sales of commercial real estate. With more than 30 years' experience in mixed-use commercial real estate, he has led development of 3 million+ square feet of office, industrial, retail and hospitality properties, including Walkers Brook Crossing, Riverside Landing, Braintree Executive Center and Medsource Technologies HQ.
- **Kevin Kuechler** was trained in hydrology and related systems at Princeton University and MIT. For more than 30 years he has led and advised on hydrogeological risk assessments in local, state and federal projects. In Truro has he served as member, then chair of the Truro Water Resources Oversight Committee (WROC, 2002-18) and as Truro's representative to the Provincetown Water & Sewer Board (2011-18). He remains active on wastewater treatment, water quality standards, ground water hydrology, and related Truro matters.

DPW Campus – Town Hall Hill

Proposal by the DPW Study Group

BASIS of DESIGN

Anthony Garrett, AIA, LEED AP BD+C, PP
For DPW Study Group
July 14, 2023

BILOW GARRETT GROUP • ARCHITECTS AND PLANNERS, P.C.
161 MAIN STREET • RIDGEFIELD PARK, NJ 07660 • (201) 807-0407 • FAX (201) 807-0513

DAVID N. BILOW, A.I.A.
ANTHONY GARRETT, A.I.A., LEED AP
MATTHEW J. SPAGNOLO, A.I.A., LEED AP
MATTHEW E. BILOW, A.I.A.

July 14, 2023

RE:
Town of Truro
Department of Public Works
Town Hall Road
Truro, Massachusetts

BASIS OF DESIGN
DPW CAMPUS PROPOSAL
by the **DPW STUDY GROUP**

Working Document - To Be Revised Pending Discussions

PREAMBLE/EXECUTIVE SUMMARY

The intent of this effort is to develop a Campus layout for a new Department of Public Works Facility, (DPW), located on Town Hall Road in the town of Truro. This approach will integrate the required programmed spaces, (per the Weston and Sampson Draft study), onto the site utilizing:

- The existing topography without constructing massive retaining walls.
- Utilizing the building footprints and foundations to follow the overall characteristics of the site.
- Repositioning the existing Buildings for appropriate uses, to recapture the embodied energy embedded in these structures while minimizing investment costs for these facilities, thus reducing costs for new vehicle storage facilities.
- Repurposing the existing infrastructure to capitalize on existing embodied energy and reduce the costs and environmental impacts incurred by new facilities, including:
    - Fueling station
    - Generator
- The new structures are proposed as Pre-Engineered Building structures, (PEB) to minimize or eliminate onsite labor, thus reducing costs associated with prevailing wage and materials rates.
- Inclusion of basement space where appropriate to work with the grades and provide improved functionality such as:
    - Collection of oils from vehicles during maintenance
    - Optional overflow records storage for Town Hall
- Energy efficient strategies such as:
    - Solar Power
    - Improved thermal envelopes on new buildings which will be conditioned space
    - Daylighting integrated into a lighting control system

    - Roof to have a Solar Reflective Index, (SRI), of 78
    - Utilize demand Response Ventilation in buildings with limited occupancy to reduce energy consumption
    - Employing ventilation and air movement in lieu of full HVAC in appropriate locations, utilizing large scale destratification fans for improved air circulation
    - Integrate appropriate facets of "Passive House" design per the recently adopted Specialized Energy Code
    - Reduce carbon footprint and strive for Net Zero Energy
- Environmentally-friendly strategies such as:
    - No significant additional deforestation
    - No concerns with or additional displacement of natural habitats and endangered species
    - Reclaim wash bay water and reuse it via the non-potable plumbing
    - Eliminate environmental impacts and costs of dismantling a fuel station and rebuilding it elsewhere.

We have analyzed budget costs based upon the unit pricing contained in the Weston and Sampson Reports as well as anticipated costs for reduced scopes of work in the existing structures. We propose using PEB's and minimal construction techniques such as:

- Eliminating expensive HVAC systems in the vehicle storage areas
- Repurposing existing buildings

These will help to control costs. We estimate this design will be 40% to 50% less than the proposed monolithic facility envisioned in the Weston and Sampson Feasibility Study, while providing all the programmed spaces plus some additional flex space in the basement area and a proposed unfinished attic space. The Gross Floor Area will be 32,600 SF. These unfinished spaces can provide overflow uses such as:

- Storage
- Future buildout of the spaces in the future when needed

The project will include a new well for Potable water located off-site as well as repurposing the existing non-Potable water onsite for:

- Vehicle washing.
- Flushing of toilets.
- Other service sinks/hose bibbs in the facility not requiring Potable water.

This will also reduce the impact on the environment and provide Potable Water to the Town Hall.

The campus approach allows the project to be phased over time. The first two (2) buildings can be constructed while the current buildings remain occupied. Upon completion of Buildings 1 and 2, the current operations can be relocated into these buildings enabling the demolition of the obsolete structures, freeing up the north end of the site for the remaining construction. This will allow for the operations at this site to continue without interruption.

METHODOLOGY:

We reviewed and performed the following tasks in preparing the Concept Design:

- Reviewed all Weston & Sampson materials and other "DPW" website materials (documents, memos and reports), including most recent W&S of 8 Mar 2023
- Dickenson letter of 5 Jan 2023
- Analyzed topography of the site on the ground and through GIS
- Visited this and other DPW sites
- Investigated alternative building types used at other similar facilities
- Investigated potential energy saving measures including on-site energy generation using Solar Arrays on the new structures
- Investigated best practices and current methods of salt versus brine storage and uses

This led us to design a "**DPW Campus**" with five (5) detached buildings respecting the site conditions (specifically, the topography). This would include building three (3) new buildings and repurposing two (2) of the existing buildings for vehicle storage. This will enable the existing fueling station and generator to remain in place, which reduces overall costs for the facility. We are now recommending conversion to brine for many reasons including reduced cost to acquire and use, cost, safer storage, and less adverse environmental impact overall.

BASIS OF DESIGN – ARCHITECTURAL

General Information - The following codes and standards apply to this project:

- 2021 International Building Code (IBC)
- 2021 International Fire Code (IFC)
- 2021 International Existing Building Code (IEBC)
- 2015 International Mechanical Code (IBC)
- 2020 National Electric Code (NEC) – Effective January 1, 2020
- National Fire Protection Association (NFPA) 101 Life Safety Code 2012
- Massachusetts Specialized Energy Code – 225 CMR 22.00 and 225 CMR 23.00
- Uniform State Plumbing Code – 248 CMR 10.00 – 4-30-2021
- Barrier Free Accessibility Code – 521 CMR-2006
- Applicable ASHRAE and SMACNA Standards
- Other applicable Federal, State and Local Codes
- Other applicable standards

Occupancy and Construction Types:

The proposed uses of the various buildings include:

- B Business - for the Administration Building and Employee Support Spaces
- S-1 Moderate Hazard Storage - for the Vehicle Maintenance Area
- F-1 Moderate Hazard Factory - for the Workshop
- U Utility - for the Vehicle Storage areas

The proposed construction type will be **Type 2B Non-combustible, unprotected**.

Employing the campus approach, most of the buildings **WILL NOT** require Fire Sprinkler protection due to the small footprints, (based upon Table 506 in the IBC for Type 2B construction). Buildings 1A and 1B, including the windowless story basement, will require a small Fire Sprinkler system.

Building Descriptions

- **Building 1** totals 14,000 SF. We anticipate segregating the building into (3) discrete areas (Buildings 1A-C):

A. **Vehicle Maintenance Building** with (5) Vehicle service bays. It would be a PEB, (Insulated metal roof and walls, meeting Energy Codes), Conditioned; see note below regarding solar panels, Finished Floor Elevation, (FFE) 122.0; Area: 6000 SF; it would share toilet facilities with Section B.

B. **Workshops and Utilities** space, (well water entry, building utilities). This building would be a conventional Pre-Engineered Building, PEB, (Insulated metal roof and walls, meeting Energy Codes), Conditioned; see note below regarding solar panels, FFE 122.0'; Area: 4000 SF.

C. **Vehicle Storage** with four 4 bays plus a wash bay. We anticipate it being either a lightweight steel framed "tensile structure" (with removable panels for the summer) or greenhouse with translucent roof to allow for direct solar gain and daylighting. The foundation would act as a retaining wall for the grades. Finished Floor Elevation, FFE 113.5'; Area: 4000 SF. The proposed costs assume a tensile structure is used.

In addition, we suggest constructing a partial basement under the center portion of the Building 1 for:

i. Utility entry
ii. Collection of oils associated with the Vehicle Maintenance storage
iii. Overflow storage from Town Hall
iv. Direct access from Building 1B to 1C

`

The basement comports with the overall Grading/Topography of the site and provides additional structural support.

- **Building 2** totals 3,200 SF. It would be used as the Administration Building and Employee Support space and would be a PEB, (Insulated metal roof and walls, meeting Energy Codes), Fully conditioned; see note below regarding solar panels, FFE 122.0'. In addition, we have included an unfinished attic space for future use, (less than 3,000 SF which alleviates the need for an elevator).
- **Building 3** totals 7,300 SF. It is broken into two discreet areas:
    A. PEB houses six (6) vehicle bays with an FFE of 116.5'; Area: 4500 SF, unconditioned.
    B. A lightweight "tensile structure", (removable panels for the summer), to store either Brine or Salt. It would need to be modified to provide containment. The foundation would function as a retaining wall for the grades. Finished Floor Elevation, FFE 111.5, 2800 SF
- **Building 4 (repurposed)** totals 5,075 SF and is repurposed for use as Vehicle Storage, (4) bays. Since it is already heated, vehicles that need to be active during Winter weather events can be stored in this building.
- **Building 5 (repurposed)** totals 2100 SF and is repurposed for use as Vehicle Storage with six (6) bays, unconditioned.

Building Notes

A. We suggest putting solar arrays on the south-facing portion of the gable/shed roofs. We anticipate Building 1 will have flat and shed portions of roof; the sloped shed portions will face south and especially accommodate the solar arrays.
B. Work associated with the Repositioning of the Existing structures will include:

<u>Interior</u>

- Demolish obsolete interior walls
- Repaint walls and ceilings white as needed
- Replace existing light sources with LED fixtures throughout
- Sealing the existing concrete slabs

<u>Exterior</u>

- Repointing of block exterior, as needed
- Removal of abandoned equipment (air vents and ducts)
- Removal of window bars (on site property only. Windows facing Town Hall Road to remain in place), to improve the aesthetics of the building
- Painting of Exterior
- Patching of roof (pending roof walk-through)

Site Layout

The site layout will accommodate vehicle movement and a septic/leaching field. We propose thirty-six (36) striped parking stalls plus two (2) barrier-free stalls. There will be approximately 120 feet of short terraced retaining wall required. The walls will be less than 4'-0" in height and can be made of segmented masonry with geo-grid. The areas surrounding the existing buildings to remain will be graded up at 1 -in-3 slope to eliminate the need for underpinning.

BASIS OF DESIGN – MEP SYSTEMS

Plumbing

- Installation of new incoming watermain from remote well for potable water
- Drill new well onsite for non-Potable water, or re-use existing well
- Water distribution to each of the separate buildings, (underground)
- New Toilet rooms including fixtures and piping
- New kitchen facilities
- New domestic water piping and drainage
- Provide new energy-efficient hot water heaters for the required plumbing fixtures. The size, quantity, type, and capacity shall be determined based on fixture type, layout and location, and the utilities available. New hot water and return piping shall be installed as needed to suit the new layouts and fixtures. We will investigate whether Solar Water heaters are appropriate to provide requisite hot water supply, thereby reducing energy consumption

Fire Protection

- The small footprint of each building eliminates the need for Fire Sprinklers throughout; the only area requiring Fire Sprinkler Protection (based upon specific occupancy as listed in Section 903 of the IBC) will be Buildings 1A and B inclusive of the basement. It will be a limited sprinkler system and depending on the available water pressure, may require a small pump. The system can use non-potable water.

MECHANICAL SYSTEMS

General Design Criteria

All mechanical systems will be designed based on the codes and standards listed above.

All HVAC equipment will be sized based on the following criteria:

- **Outdoor Design** Conditions (Based on Chatham, MA):
  - Summer: 84°F Dry Bulb/ 74.0°F Wet Bulb (ASHRAE 1%).
  - Winter: 10°F Dry Bulb (Exceeds ASHRAE 99.6%).
- **Indoor Design** Conditions
  - Summer: 75°F Dry Bulb/ 50% Relative Humidity (Offices Workshop)

Vent Only (Vehicle Maintenance, Enclosed Vehicle Storage and Storage Spaces)

- Winter: 70°F Dry Bulb (No Humidity Control) All Occupied Spaces

  45°F Dry Bulb (No Humidity Control) Vehicle Maintenance, Enclosed Vehicle Storage and Storage Spaces.

The building envelope and glass cooling and heating loads will be calculated using design criteria based on the existing construction of the building. All new building elements will be calculated using the maximum values listed in the Energy Code, ASHRAE 90.1-2019.

New Mechanical Systems

The proposed HVAC systems to serve the occupied spaces in the buildings including the office area shall be designed to the applicable building codes and design criteria, as follows:

- **Non-office areas**

  The design intent is to provide infrared heating and large-scale destratification fans with requisite ventilation units, mounted on the roof to heat and ventilate the space. The exact quantity and configuration shall be coordinated during the design phase of the project. Supplemental heating will be added at the overhead doors where needed to maintain indoor conditions. The ventilation systems will be designed with controls based upon demand response needs to reduce energy consumption.

- **Office Areas**

  The intent is to specify new split HVAC Units for the Office Area and Employee support spaces. The quantity of HVAC units, and type of system control (constant vs variable air volume), will be determined based on the appropriate interior temperature zoning, based on the proposed space layout and function. Ductwork will be installed as needed to suit the new layouts and use. The cooling capacity for the office area is estimated to be 10 tons. Adequate Outside Air will be distributed in the occupied spaces and in the winter will be tempered by an ERV system, (heat recovery wheel), to reduce energy consumption. Additional supplemental systems for any high heat gain spaces, similar to IT and/or data rooms will be designed as needed and coordinated with the owner's requirements.

- **General Systems**

  Toilet exhaust fans and ductwork shall be designed for all bathroom areas, in compliance with all applicable codes.

  Supplemental heaters shall be designed for main personnel entry doors and vestibules as needed for infiltration and draft control.

New Electric Service for the Campus

We recommend a new 1000Amp 277/480V 3Phase 4Wire electrical service (via a pad mount transformer) at the southwest corner of the site, (proximate to Building 1A). Distribution at the 480V level and 120/208V level shall be provided for the new HVAC,

lighting, and general power requirements. For the new service Switchboard, provide a new 1000Amp main fused disconnect, "Eversource" section and main distribution breaker section (65kAIC). We recommend providing electric service to each building as follows:

- **Building 1 -** 400Amp 277/480V 3Phase 4Wire sub-distribution panel (35kAIC - 400Amp Main Lug Only with 30 poles), 75kVA 480V-Delta 3Phase Primary/120/208V 3phase 4Wire Secondary step-down transformer and 120/208V 3Phase 4Wire panelboard with 250Amp 3P main breaker and 42 poles (10kAIC). The lighting circuitry shall be 277V and the HVAC units shall be 480V 3Phase. All general-purpose receptacles and general power shall be fed from the 120/208V panelboard.
- **Building 2 -** 250 Amp 120/208V 3Phase 4Wire panelboard with 250Amp 3Phase main breaker and 42 poles (10kAIC). The lighting circuitry shall be 120V and the HVAC units shall be208V 3Phase
- **Building 3 -** 150 Amp 120/208V Single Phase 4Wire panelboard with 150Amp main breaker and 24 poles (10kAIC). The lighting circuitry shall be 120V
- **Building 4 -** 100 Amp 120/208V Single Phase 4Wire panelboard with 100Amp main breaker and 24 poles (10kAIC). The lighting circuitry shall be 120V
- **Building 5 -** 100 Amp 120/208V Single Phase 4Wire panelboard with 100Amp main breaker and 24 poles (10kAIC). The lighting circuitry shall be 120V

Fire Alarm System

Provide a fully addressable Fire Alarm System. The system is to be fully addressable and shall provide communication and control for various devices such as intelligent smoke and heat detectors, addressable relay and monitor modules, annunciator(s), horn/strobe devices, pull stations, etc. The non-office areas shall be provided with horn/strobe devices in areas of egress, with pull stations at egress doors. The office and mechanical or electrical rooms shall be provided with heat and/or smoke detectors in addition to the horn/strobe devices and pull-stations at egress doors. The Fire Alarm system shall monitor the sprinkler flow and tamper system and shall monitor the Fire pump Operation as applicable. Provide a new Fire Alarm system per NFPA 72 2016 and IBC 2021 editions. The new Fire Alarm System shall be a Notifier System Type NFS-320 or equivalent by Silent Knight.

New Lighting

- **Non-office areas -** Provide industrial type LED fixtures, mounted at underside of the roof structure with a designed footcandle level of 25-30 at 3'-0" above the floor. We recommend the fixture spacing to be approximately 25'x 25'. The fixture shall be either Holophane type PHG 36000LM (37,000 lumens) or Oracle type ORHB1-LED (390000 lumen output). Fixtures shall be provided with built-in occupancy sensors, 50% dimming, and with blue-tooth capability for control via mobile phone or other wireless type devices. Provide Emergency lighting via Emergency battery packs at the means of egress areas or built into the fixtures. For the Vehicle Storage areas, provide similar lights and controls for each bay.

- **General Admin/Employee space -** Provide new 2'x4' or 2'x2' recessed LED fixtures, typical 8'x8' spacing and emergency lighting per latest IBC and NEC codes. Warm light options
- **Integrate the lighting system** with a **Daylighting Control System** to shut down lights when adequate daylight is harvested

General Power

- **Vehicle Maintenance Area and Workshop –** provide circuits for new heaters and supplemental ventilation/exhaust systems. Provide dedicated receptacles at locations of:
  - Vehicle lifts
  - Shop equipment
  - Hoists
  - add general receptacles throughout.
- **General Admin/Employee space** – Provide general receptacles for office workstations and office equipment
- **Vehicle storage –** Provide general receptacles, (1) per bay

Referenced Drawings

The following drawings describe the proposed Architectural and Site modifications which comprise the Basis of Design.

Drawing No.	Title	Date
EX-SP-100	Existing Conditions Site Sketch	July 14, 2023
SK-SP-100	Site Sketch	July 14, 2023
SKE-100	Photo Elevations Existing Conditions	July 14, 2023
SK-200	Section/elevation	July 14, 2023

Respectfully Submitted,

Anthony Garrett, Architect
for the DWP Study Group