# CHARTER TOWNSHIP OF GARFIELD
# TOWN BOARD MEETING

Tuesday, April 25, 2017 at 6:00pm
Garfield Township Hall
3848 Veterans Drive
Traverse City, MI 49684
Ph: (231) 941-1620

## AGENDA

**ORDER OF BUSINESS**
**Call meeting to order**
**Pledge of Allegiance**
**Roll call of Board Members**

1. **Public Comment**

   **Public Comment Guidelines:**
   Any person shall be permitted to address a meeting of The Township Board, which is required to be open to the public under the provision of the Michigan Open Meetings Act, as amended. (MCLA 15.261, et.seq.) Public Comment shall be carried out in accordance with the following Board Rules and Procedures: a.) any person wishing to address the Board is requested to state his or her name and address. b.) No person shall be allowed to speak more than once on the same matter, excluding time needed to answer Township Board Member's questions. Where constrained by available time the Chairperson may limit the amount of time each person will be allowed to speak to (3) minutes. 1.) The Chairperson may at his or her own discretion, extend the amount of time any person is allowed to speak. 2.) Whenever a Group wishes to address a Committee, the Chairperson may require that the Group designate a spokesperson; the Chairperson shall control the amount of time the spokesperson shall be allowed to speak when constrained by available time.

2. **Review and approval of the Agenda - Conflict of Interest**

3. **Consent Calendar**

   The purpose of the Consent calendar is to expedite business by grouping non-controversial items together to be dealt with in one Board motion without discussion. Any member of the Board, staff or the public may ask that any item on the Consent Calendar be removed there from and placed elsewhere on the Agenda for full discussion. Such requests will be automatically respected. If any item is not removed from the Consent Calendar, the action noted in parentheses on the Agenda is approved by a single Board action adopting the Consent Calendar.

   a. Minutes – April 11, 2017 (Recommend Approval)

   b. Bills -

      General Fund $ 42,613.32
      (Recommend Approval)

c. County Road Improvement Agreement between the Grand Traverse County Road Commission and Garfield Township (Recommend Approval)

4. **Items Removed from the Consent Calendar**

5. **Correspondence**

   a. Email from Melissa Johnson regarding Barlow Street improvements

6. **Reports**

   a. GT Metro Fire Department Report
   b. County Commissioner's Report
   c. Personnel Committee's Report
   d. Treasurer's Report
   e. Clerk's Report
   f. Supervisor's Report

7. **Unfinished Business**

   a. Awarding of bid for Potable Water Storage Tank

   b. Update on SAW grant and consideration of Assessment Management Plan proposal

8. **New Business**

   a. Grand Traverse Road Commission's presentation regarding Logan's Landing/South Airport Road intersection improvements

   b. PD 2017-31 – BVNP Oversight

   c. MDOT Presentation regarding U.S. 31 Signalization

9. **Public Comment**

10. **Other Business**

11. **Adjournment**

_____
Lanie McManus, Clerk

The Garfield Township Board will provide necessary reasonable auxiliary aids and services, such as signers for hearing impaired and audio tapes of printed materials being considered at the meeting to individuals with disabilities upon the provision of reasonable advance notice to the Garfield Township Board. Individuals with disabilities requiring auxiliary aids or services should contact the Garfield Township Board by writing or calling Lanie McManus, Clerk, Ph: (231) 941-1620, or TDD #922-4412.

# CHARTER TOWNSHIP OF GARFIELD
## TOWN BOARD MEETING
## April 11, 2017

Lanie McManus called the Town Board Meeting to order on April 11, 2017 at 6:00 p.m. at the Garfield Township Hall, 3848 Veterans Drive, Traverse City, Michigan.

**Pledge of Allegiance**

**Roll call of Board Members**

Present: Denise Schmuckal, Jeane Blood Law, Dan Walters, Steve Duell, Lanie McManus and Molly Agostinelli

Absent and Excused: Chuck Korn

Agostinelli was elected to serve as chair for the meeting since Korn was absent.

1. **Public Comment (6:01)**
   None

2. **Review and Approval of the Agenda - Conflict of Interest (6:01)**
   *Agostinelli asked to add New Business Item 8c – Parks and Recreation request for $1,800 to apply for a DNR Natural Resources Trust fund grant; and New Business Item 8d, Resignation of Sue Muha.*

   *Schmuckal moved and McManus seconded to approve the agenda as amended.*

   *Yeas: Schmuckal, McManus, Walters, Duell, Blood Law, Agostinelli*
   *Nays: None*

3. **Consent Calendar (6:04)**
   a. **Minutes**
      March 28, 2017 Meeting (Recommend Approval)

   b. **Bills**
      General Fund $128,695.54
      (Recommend Approval)

   c. **MTT Update (Receive and File)**

**d. PD 2017-28 – Introduce and schedule for Public Hearing for May 8, 2017 at 6:00 p.m. on the proposed zoning regulations for the Grand Traverse Commons (Recommend Approval)**

**e. PD 2017-15 Zoning Ordinance Amendment No. 6 to Ordinance No. 68 – Introduce and schedule for Public Hearing regarding Hotel Standards on May 9, 2017. (Recommend Approval)**

**f. PD 2017-27 – Request for a Special Site Visit Meeting to be held at 3000 Racquet Club Drive on May 9, 2017 at 4:30 p.m. (Recommend Approval)**

**g. Consideration of turnover letter from Jennifer Hodges – GFA Project Manager for Olesons/US 31 Service Drive (Recommend Approval)**

Walters asked to remove Consent Calendar item g. and place it under item 4.a.
Duell asked to remove Consent Calendar item e. and place it under item 4.b.

*Duell moved and Walters seconded to approve the consent calendar as amended.*

*Yeas: Duell, Walters, Blood Law, McManus, Schmuckal, Agostinelli*
*Nays: None*

**4. <u>Items Removed from the Consent Calendar (6:07)</u>**

**a. Consideration of turnover letter from Jennifer Hodges – GFA Project Manager for Olesons/US 31 Service Drive**

Walters noticed that the easement descriptions do not match in the turnover documents. It is one 25 foot easement and not two 20 foot easements.

*Walters moved and Schmuckal seconded to accept the turnover letter pending clarification in the measurements and verbage in the turnover documents from Gourdie-Fraser.*

*Yeas: Walters, Schmuckal, McManus, Blood Law, Duell, Agostinelli*
*Nays: None*

**b. PD 2017-15 Zoning Ordinance Amendment No. 6 to Ordinance No. 68 – Introduce and schedule for Public Hearing regarding Hotel Standards on May 9, 2017.**

Duell said he was the only dissenting vote and explained to board members why he dissented on the vote. He felt that 40 feet in height for hotel standards would be better than 35 feet and would bring more aesthetically pleasing buildings into theTownship. Blood Law would like to hear representation from the Planning Department on the matter. Board members agreed to hold the Public Hearing and invite a representative from the Planning Department.

*Duell moved and Blood Law supported to approve PD-2017-15 Zoning Ordinance Amendment No. 6 to Ordinance No. 68 –Introduce and schedule for Public Hearing regarding Hotel Standards on May 9, 2017.*

*Yeas: Duell, Blood Law, McManus, Schmuckal, Walters, Agostinelli*
*Nays: None*

5. **Correspondence (6:20)**
   a. Grand Traverse Conservation District – March 2017 Report

6. **Reports**
   a. **BATA Report (6:20)**
   Kelly Dunham from BATA gave board members a report on the upcoming millage request on May 2nd. She said that the .5 mill request would help provide over a half million rides per year. 35% of their total funding comes from the local millage. The average homeowner would pay extra $16 per year and would provide BATA with an additional $1.1 million. The money will go towards more frequent service, tech improvements, fleet and facility upgrades, improved park and rides and rural service improvements. Board members asked questions and discussed the proposed millage.

   b. **Construction Report**
   None

   c. **Sheriff's Report (6:41)**
   Lieutenant Chris Barsheff said that the statistics are still being worked on for accuracy and it should be resolved shortly. He talked about pairing with the Boardman River Clean Sweep to clean up trash and homeless activity remnants and taking the rubish to the DNR dumpster. Signage may help, but he continues to work to resolve the issue. April 29th will be a prescription drug drop off day and he continues active shooter trainings. Barsheff said that a focus on retail fraud continues as the department works on ways to be more efficient with that type of crime.

   d. **County Commissioner's Report**
   No report

   e. **Personnel Committee Report (6:54)**
   Schmuckal said that there would be interviews for the Deputy Planner position on Monday, April 17th.

   f. **Parks and Recreations Report**
   No report

**g. Clerk's Report (6:55)**
McManus said she submitted her report in writing and that her office has been busy preparing for the May 2nd election.

**h. Supervisor's Report**
No report

**7. Unfinished Business**

**a. PD 2017-29 – Public Hearing – Consideration of Adoption of Amendment #2 to Ordinance #63 to amend the Parks and Recreation Ordinance to allow 7 members. (6:56)**
Agostinelli opened the Public Hearing at 6:56 p.m. and no one wished to speak.

*Walters moved and Blood Law seconded THAT Amendment No. 2 to the Parks and Recreation Commission Ordinance No. 63, as described within and attached to PD Report 2017-29 be approved.*

Board members discussed the proposed amendment and asked for the legal opinion on the establishment of the body. They decided to place that item on the agenda again for the next meeting to discuss the legal opinion.

*Yeas: Walters, Blood Law, Schmuckal, Duell, McManus, Agostineli*
*Nays: None*

**8. New Business**

**a. PD 2017-24 Consideration of Parks and Recreation Commission recommendation to accept a bid by SEEDS for the amount of $34,575.20 to construct the Miller Creek Boardwalk. (7:08)**
SEEDS bid this out last October and since lumber prices have increased, the new bid is for $36,354.20. The money will come from the Parks budget.

*Schmuckal moved and McManus seconded THAT the bid provided by SEEDS for the amount of $36,354.20, to construct the Miller Creek Boardwalk, be accepted as presented.*

Board members commented on the maintenance of these trails and boardwalks. Schmuckal added that maintenance may be an issue discussed in the Parks Master Plan.

*Yeas: Schmuckal, McManus, Duell, Blood Law, Walters, Agostinelli*
*Nays: None*

**b. Consideration of Building Committee recommendation of Garfield Township Hall Exterior Repair and Maintenance Bid (7:19)**

Walters said that one bid was received from Surfaces, Inc. A revised bid was submitted for $86,554.00. A special Lotusan coating on the paint, would cost an extra $6,442, but would come with a five year guarantee and is self-cleaning. The revised total would be $92,996. McManus indicated that there is money in the budget, but an amendment may be needed. Board members discussed the bid and the work to be completed.

*Schmuckal moved and Duell seconded to accept the bid from Surfaces, Inc. in the amount of $92,996 for township hall exterior repairs and maintenance.*

*Yeas: Schmuckal, Duell, Blood Law, McManus, Walters, Agostinelli*
*Nays: None*

**c. Parks and Recreation Request for $1,800 to apply for a DNR grant (7:32)**
The $1,800 is for engineering expenses to apply for a DNR grant and will come from the Parks and Recreation budget.

*Schmuckal moved and Walters seconded to approve $1,800 for engineering expenses related to applying for a DNR grant.*

*Yeas: Schmuckal, Walters, Blood Law, Duell, McManus, Agostinelli*
*Nays: None*

**d. Resignation of Sue Muha (7:34)**
*Schmuckal moved and Duell seconded to accept the resignation of township appraiser, Sue Muha.*

*Yeas: Schmuckal, Walters, Duell, McManus, Blood Law, Agostinelli*
*Nays: None*

*Schmuckal moved and Walters seconded to accept the job description for the vacated appraiser position.*

*Yeas: Schmuckal, Walters, Blood Law, Duell, McManus, Agostinelli*
*Nays: None*

*Schmuckal moved and Duell seconded to approve the placement of ads for the vacant position in the Record Eagle and on the MAA website.*

*Yeas: Schmuckal, Duell, McManus, Blood Law, Walters, Agostinelli*
*Nays: None*

Schmuckal added that applications will be accepted through April 28th and reviewed by the Personnel Committee on May 3rd and interviews will be held on May 8th .

9. **Public Comment: (7:39)**
   None

10. **Other Business (7:39)**
    Duell asked about the Reports section and how one is added to the agenda.

11. **Adjournment**
    Agostinelli adjourned the meeting at 7:42pm.

Chuck Korn, Supervisor
Charter Township of Garfield
3848 Veterans Drive
Traverse City, MI 49684

Lanie McManus, Clerk
Charter Township of Garfield
3848 Veterans Drive
Traverse City, MI 49684

CHECK REGISTER FOR CHARTER TOWNSHIP OF GARFIELD
CHECK DATE FROM 0/ 2017 - 04/19/2017



| Check Date | Bank | Check | Vendor | Vendor Name | Description | Amount |
|---|---|---|---|---|---|---|
| Bank GEN General | | | | | | |
| 04/13/2017 | GEN | 35902 | 0130 | ANNE WENDLING | CONTRACTED SVCS | 273.00 |
| 04/13/2017 | GEN | 35903 | 0930 | BRENDA BURROWS | FRONT DESK | 240.00 |
| 04/13/2017 | GEN | 35904 | 0064 | CITY OF TRAVERSE CITY | 170975-98310 | 10.61 |
| 04/13/2017 | GEN | 35905 | 0048 | CONSUMERS ENERGY | 100000311801 | 6,616.25 |
| 04/13/2017 | GEN | 35906 | 0124 | ENGINEERED PROTECTION SYS. | SVC AGREEMENT 5.1-7.31.17 | 354.75 |
| 04/13/2017 | GEN | 35907 | 0001 | GARFIELD CHARTER TOWNSHIP | HSA | 155.00 |
| 04/13/2017 | GEN | 35908 | 0050 | INTEGRITY BUSINESS SOLUTIONS | PAPER | 89.97 |
| 04/13/2017 | GEN | 35909 | 0434 | LAND INFORMATION ACCESS ASSOC | TV | 380.00 |
| 04/13/2017 | GEN | 35910 | MISC | MITCHELL GRAPHICS INC | CERTIFICATION LABELS | 121.00 |
| 04/13/2017 | GEN | 35911 | 0021 | PITNEY BOWES INC. | LEASING CHARGE | 393.63 |
| 04/13/2017 | GEN | 35912 | 0509 | TEAMSTERS LOCAL 214 | UNION DUES | 151.00 |
| 04/13/2017 | GEN | 35913 | 0202 | UNITED WAY | UNITED WAY | 90.00 |
| 04/13/2017 | GEN | 35914 | 0006 | VOYA INSTITUTIONAL TRUST COMPANY | DEFERRED COMP VF3202 | 1,909.00 |
| 04/18/2017 | GEN | 35915 | 0020 | CHUCK KORN | MILEAGE | 215.93 |
| 04/18/2017 | GEN | 35916 | 0375 | FIFTH THIRD BANK | 5473785478000162 | 862.82 |
| 04/18/2017 | GEN | 35917 | 0375 | FIFTH THIRD BANK | 5473785400027192 | 290.05 |
| 04/18/2017 | GEN | 35918 | 0903 | I.T. RIGHT | INTERNAL SSD | 168.59 |
| 04/18/2017 | GEN | 35919 | 0911 | KLM LANDSCAPE | 2016 PARK FERTILIZER | 4,200.00 |
| 04/18/2017 | GEN | 35920 | 0434 | LAND INFORMATION ACCESS ASSOC | 2ND QTR PEG FEES | 24,011.46 |
| 04/18/2017 | GEN | 35921 | 0557 | MAPLE RIVER DIRECT MAIL | 1ST QTR POSTAGE | 13.05 |
| 04/18/2017 | GEN | 35922 | 0941 | MICHIGAN MUNICIPAL LEAGUE | DEPUTY PLANNER AD | 250.40 |
| 04/18/2017 | GEN | 35923 | 0498 | NORTHERN MI JANITORIAL SUP | SUPPLIES | 202.60 |
| 04/18/2017 | GEN | 35924 | 0181 | OLSON, BZDOK, & HOWARD | LEGAL FEES | 681.50 |
| 04/18/2017 | GEN | 35925 | 0054 | SONDEE, RACINE, DOREN | LEGAL FEES | 609.46 |
| 04/18/2017 | GEN | 35926 | 0051 | THE COPY SHOP | JOINT PLANNING BOOKLETS | 102.06 |
| 04/18/2017 | GEN | 35927 | 0142 | VERIZON | PHONES | 221.19 |

GEN TOTALS:

| | |
|---|---|
| Total of 26 Checks: | 42,613.32 |
| Less 0 Void Checks: | 0.00 |
| Total of 26 Disbursements: | 42,613.32 |

3.b.

GRAND TRAVERSE COUNTY ROAD COMMISSION

## COUNTY ROAD IMPROVEMENT AGREEMENT BETWEEN THE GRAND TRAVERSE COUNTY ROAD COMMISSION AND GARFIELD TOWNSHIP

Mineral Brine

| | | Estimated Cost | Twp 75% |
|---|---|---|---|
| County Maintained | 1.1 | 431.75 | 323.8125 |
| Grand Total | | | $323.81 |

_____ Garfield Township has chosen ____ (number) applications of brine.
_____ Garfield Township has chosen not to brine.
_____ The road list has been reviewed and there are no changes. (please initial)

The Board of County Road Commissioners' policy is to provide a 25% match for brine application on county maintained gravel roads with the Township paying 75%. The Township will pay 100% for all seasonal and public access roads requested.

This proposal is for the summer of 2017. Please return by April 14, 2017 to schedule the first application. The second application is scheduled for July, weather permitting.

*The above amounts are based on 2016 bids and are close approximations of costs to be incurred. Invoices will be based on actual costs billed to GTCRC which may vary from the estimates above.

Enclosed are road listings/approximated distances and maps of the areas to be brined. If any discrepancies are discovered, please contact us at your earliest convenience.

_____ _____
Township Supervisor Dated

_____ _____
Township Clerk Dated

_____ _____
Manager, GTCRC Dated

# Garfield Township Gravel Roads 2017

| Road Name | From | To | Section | Length (in miles) |
|---|---|---|---|---|
| Alley N of Floresta | Barlow | Cresent | 14 | 0.1 |
| Dracka Road | Broad | South to end | 33 34 | 0.3 |
| Keystone Drive | Keystone | Boardman View | 34 | 0.2 |
| Kyselka | US-31 | So & east to end | 28 | 0.5 |
| | | | Total mileage: | 1.1 |

**From:** Melissa Johnson [mailto:melissa@blackbirdartstc.org]
**Sent:** Tuesday, April 18, 2017 9:52 AM
**To:** Melissa Johnson
**Subject:** Barlow St. Construction

Good Morning,

I am the Executive Director at Blackbird Arts, a community-based arts education studio at 1485 Barlow St. We have been at this location for over six years. We work extensively within the immediate community and beyond. As an inclusive arts studio, we frequently have students with disabilities, adults with mobility issues and developmental challenges. Over the last few months, we have observed increasingly dangerous situations on Barlow St, both for children and adults.

Last week I was behind a car that was speeding down Barlow and saw a young man in a wheelchair begin to cross the street. As I'm sure you're aware, THERE ARE NO CROSSWALKS on Barlow. I tried to honk to alert the driver in front of me, but the man was already in the road. The driver screeched and it was a near miss. This shouldn't be happening. We have consumers and friends at Brickways, Salvation Army and children in the community behind us, who frequently need to cross the street. In the winter, it is impossible to move a wheelchair along the road and even cycling is incredibly unsafe.

In the new construction proposed for Barlow, I hope you'll strongly consider the needs of this community. We serve over 3,000 children and adults each year with hands-on arts opportunities. It is important that they feel safe coming to and leaving the studio. Let's explore making this a bikeable and walkable neighborhood, so it may grow and flourish and be safe for all! We need sidewalks, bike lanes, lighting, and crosswalks. Speed bumps would be a good idea, too. What's the point of widening a street if we don't consider these necessary changes? I urge you to revisit the construction plan.

Kind Regards,
Melissa

# GTMESA 2017
# April Report

## Training Items

Fire —Apparatus pumping drills, Class A foam training, 4 firefighters to University of Illinois Light and fight live fire training
EMS— Pediatric training day

## Incidents of Interest for the last 30 days

**Kitchen fire, March 28,** Townhouse Lane, Garfield-Careless cook overheated oil on the stove top which caused fire damage to stove, kitchen cabinets, and hood. A deputy used his extinguisher to contain fire. Crews overhauled area and assured no further fire spread.

**Wildfire April 1,** Prouty Rd, East Bay-Crews responded to a brush fire that also damaged a nearby barn. The renter of the home was burning yard debris in a burn barrel and left it unattended. Upon discovering the fire there was an attempt to extinguish which was unsuccessful and delayed a Metro response. Crews contained the fire to an acre.

**Construction trailer fire April 3,** Linden St, Garfield – A suspicious fire occurred at a trailer used for recycling waste at 1:15 am. No other damage to nearby structures.

**Vehicle crash with extrication April 5,** N Long Lake, Garfield-A crash at Barnes road entrapped the female passenger. Crews from Station 11 and 12 extricated the patient and North Flight transported to Munson.

**Chimney fire April 7,** Carlisle, East Bay-Crews extinguished a chimney fire before causing damage to the structure. The fire was extinguished by removing remaining firewood in wood burner, utilizing chimney bombs of dry chemical agent in zip lock baggies from the roof, and dismantling the chimney pipe.

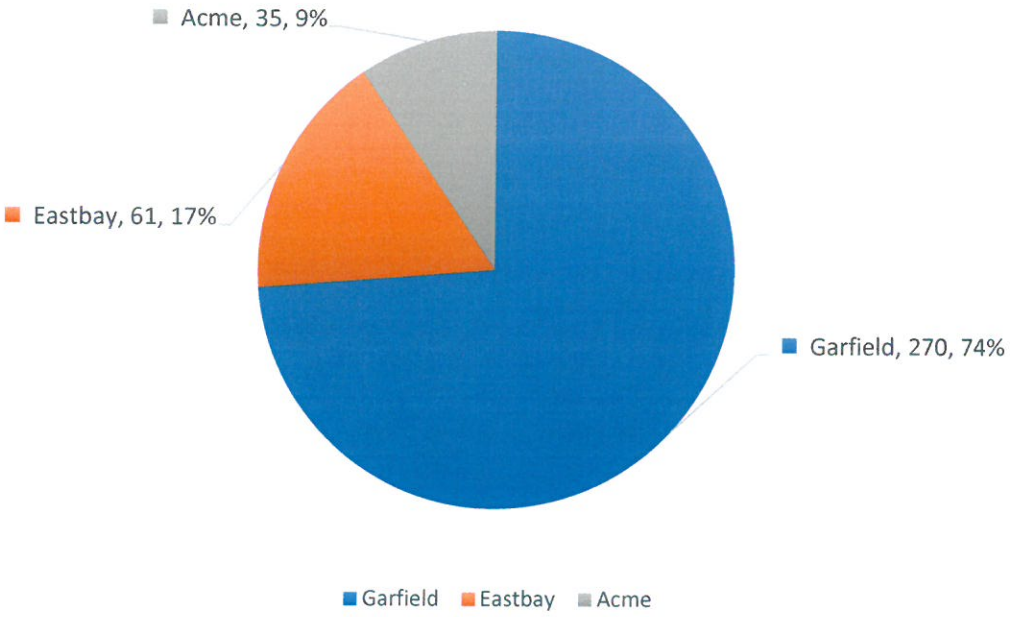
**Wildfire April 8,** Wyatt Garfield-A reported field fire near the YMCA on Silver Lake was found to be on Wyatt where the resident was attempting to force a skunk from a culvert pipe by using smoke bombs. The smoke bombs caused the dry leaves to ignite. Crews found roughly 2 acres on fire upon arriving and were able to extinguish the fire in short order with the use of two 1 ¾ inch handlines and Mule 11.

**Cooking fire with fatality April 9,** Golfview Ct, Acme-A neighbor called 911 just after 1 am to report a smoke alarm and smell of smoke emitting from a neighbor's condo. Upon arrival crews made entry into the home and found burning food in a covered pot. The stove top had been shut off. The resident was found conscious on bathroom floor and said he needed help getting up. The resident was moved and found with a low BP and pale complexion, he was transported by North Flight. The man went into cardiac arrest and was pronounced after arriving at Munson. While the patient did not suffer from smoke inhalation or burns the possible excitement from the smoke detector and being startled may have caused a cardiac issue.

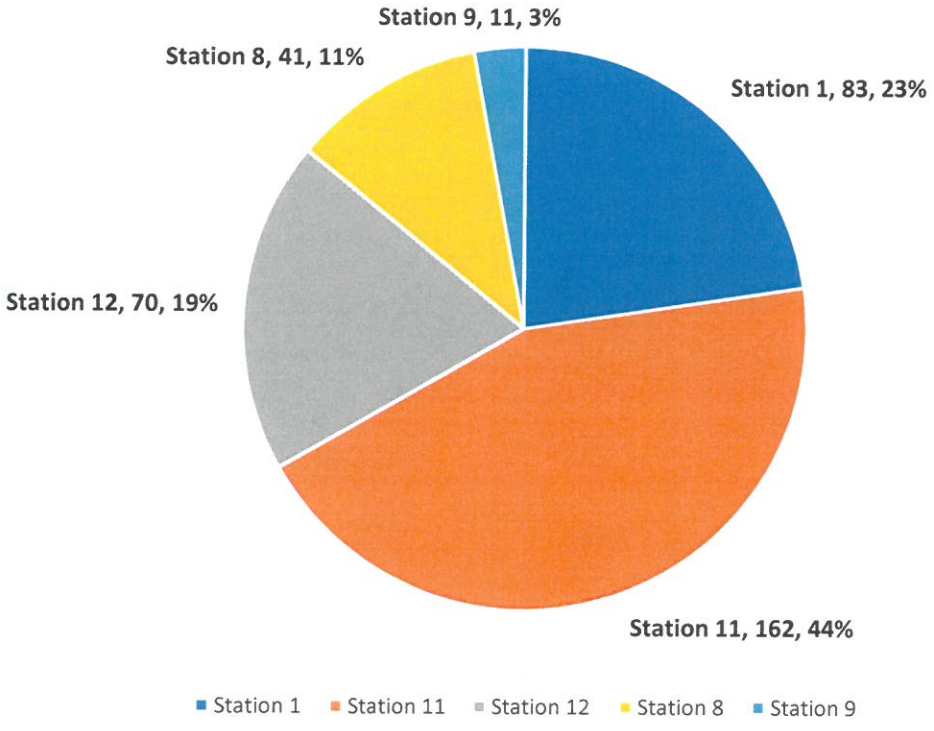
Mutual Aid Given

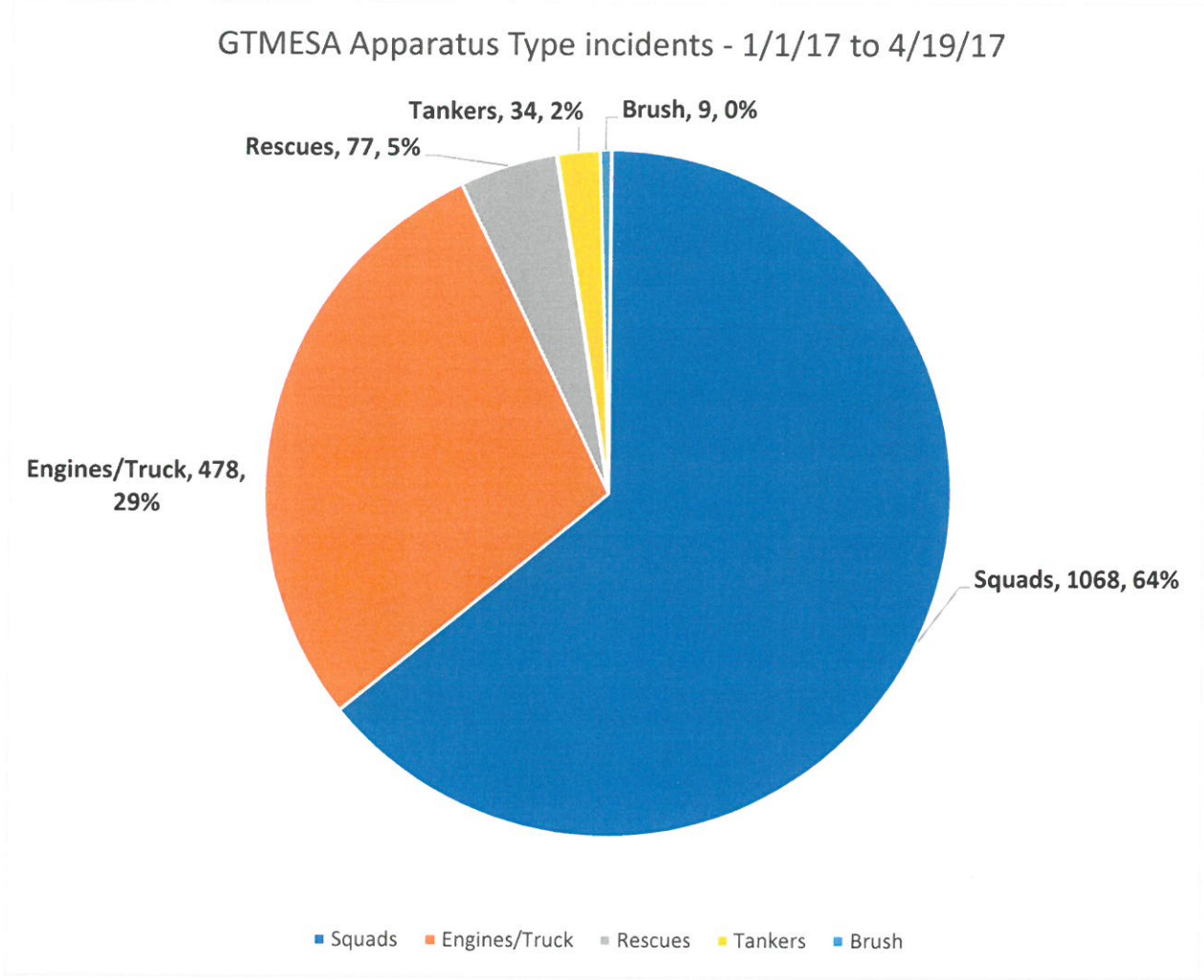
Mutual Aid Received
Blair FD 4/19 for EMS call, no North Flight available.

## GTMESA Incidents 3/22/17 to 4/19/17
## 366 Total Incidents




GTMESA Incidents by Station
3/22/17 to 4/19/17

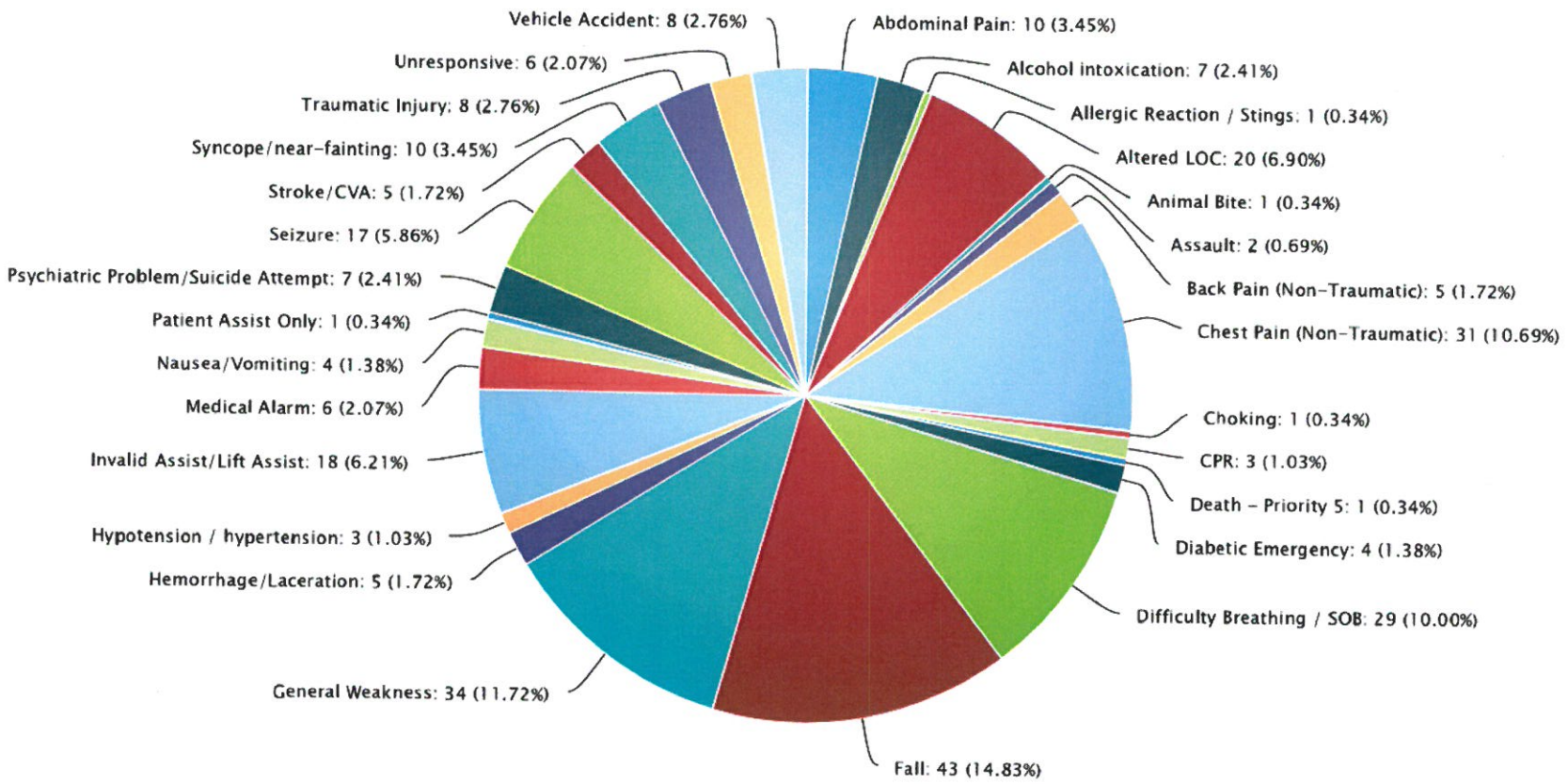



GTMESA Apparatus Type incidents - 1/1/17 to 4/19/17
Tankers, 34, 2%
Brush, 9, 0%
Rescues, 77, 5%
Engines/Truck, 478, 29%
Squads, 1068, 64%
Squads
Engines/Truck
Rescues
Tankers
Brush

| GTMESA Apparatus run volume | | |
|---|---|---|
| **Apparatus** | **Incidents** | **Percent** |
| Squad 11 | 433 | **25.96%** |
| Squad 1 | 265 | **15.89%** |
| Squad 12 | 223 | **13.37%** |
| Engine 11 | 152 | **9.11%** |
| Truck 1 | 141 | **8.45%** |
| Squad 8 | 135 | **8.09%** |
| Engine 12 | 115 | **6.89%** |
| Engine 8 | 59 | **3.54%** |
| Rescue 11 | 35 | **2.10%** |
| Rescue 1 | 28 | **1.68%** |
| Rescue 8 | 14 | **0.84%** |
| Tanker 1 | 14 | **0.84%** |
| Squad 9 | 12 | **0.72%** |
| Engine 9 | 11 | **0.66%** |
| Tanker 8 | 10 | **0.60%** |
| Tanker 9 | 7 | **0.42%** |
| Brush 9 | 3 | **0.18%** |
| Tanker 12 | 3 | **0.18%** |
| Brush 12 | 2 | **0.12%** |
| Brush 8 | 2 | **0.12%** |
| Mule 11 | 2 | **0.12%** |
| WS9 | 2 | **0.12%** |
| **Grand Total:** | 1668 | |

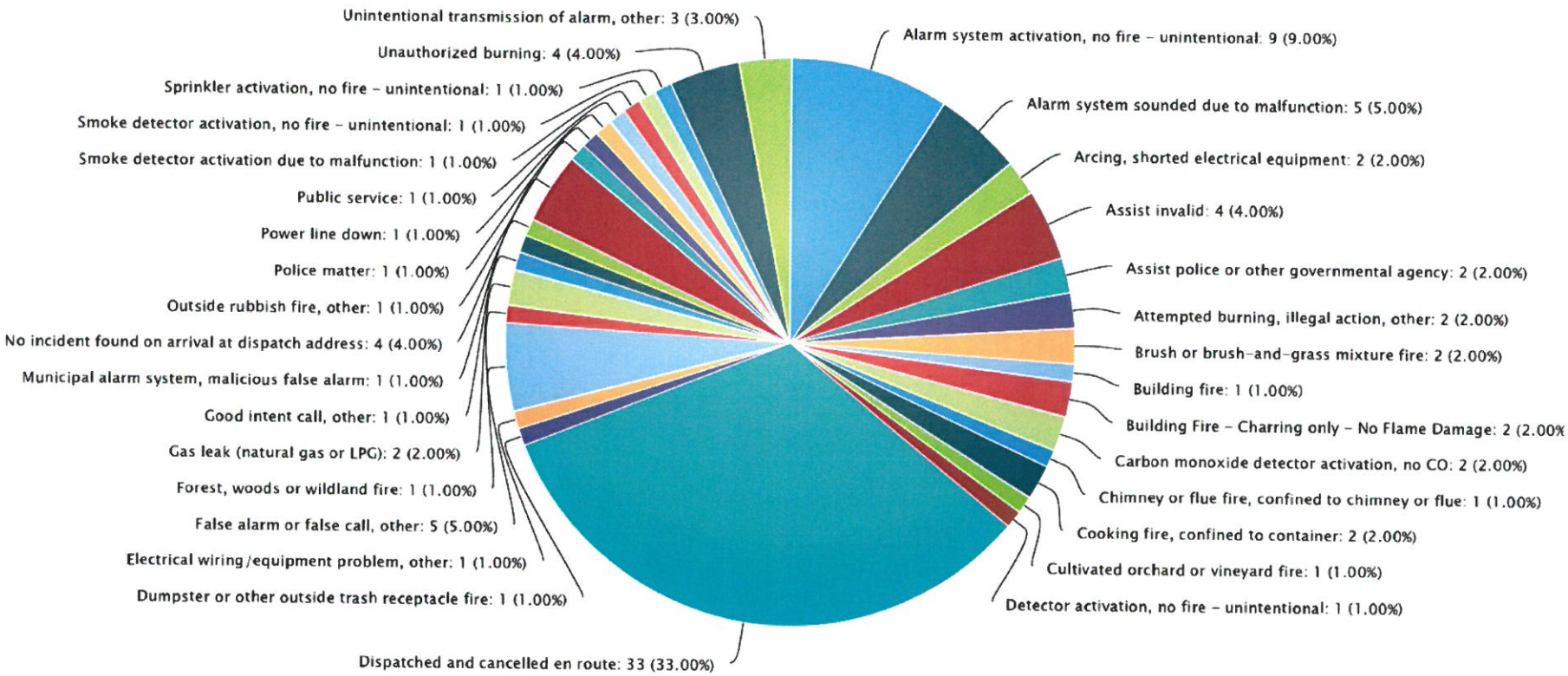
# Incident type – EMS

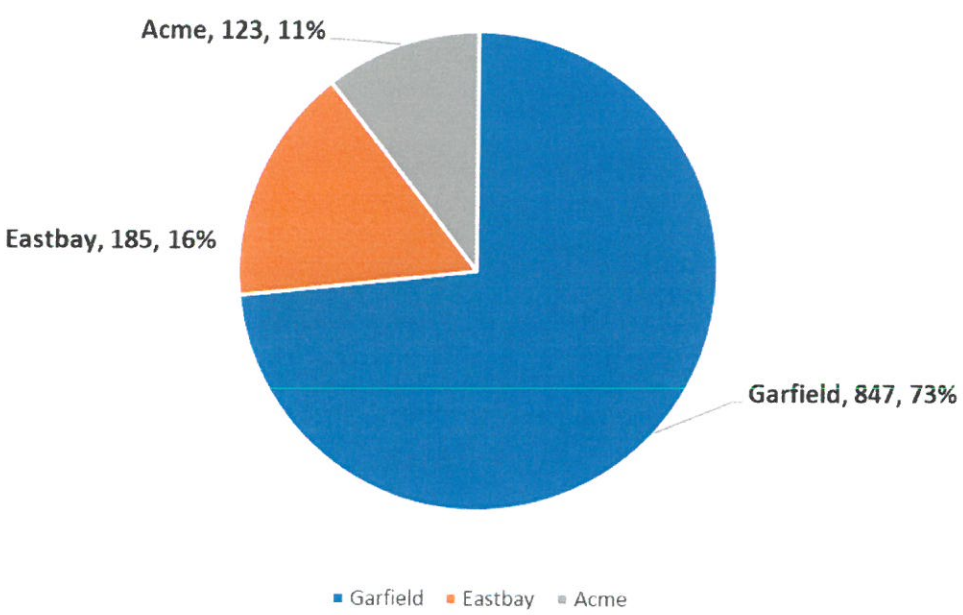
3/22/17 to 4/19/17



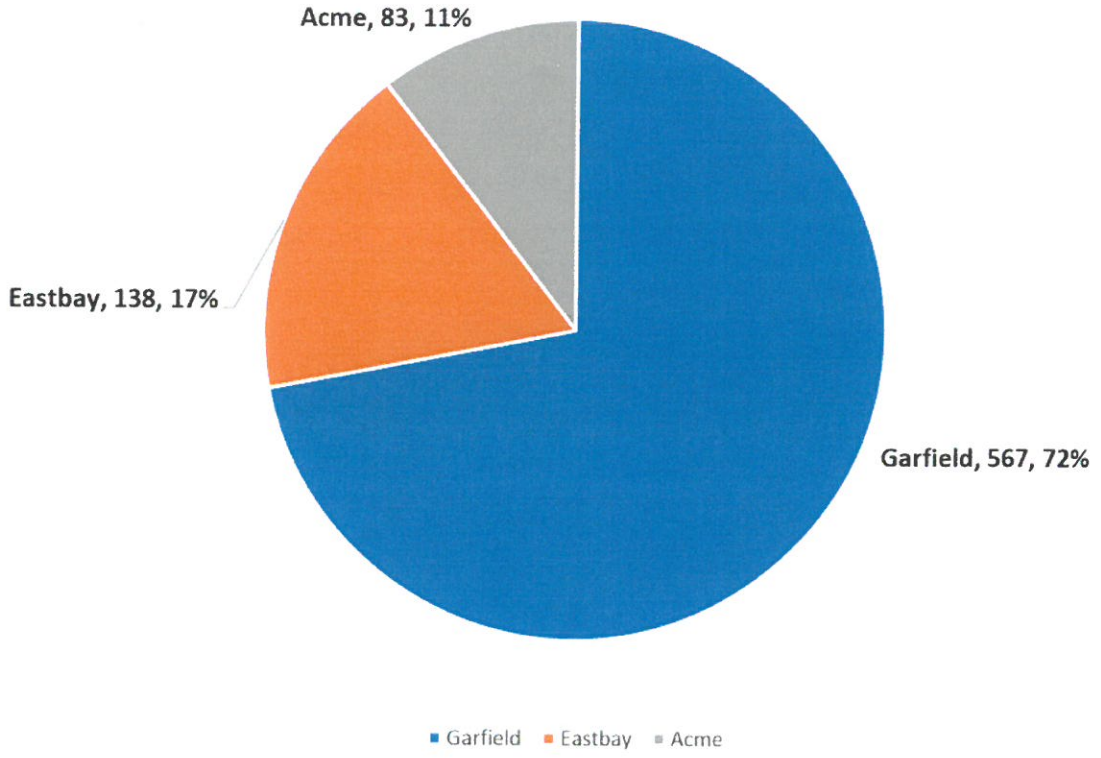
# Fire Types

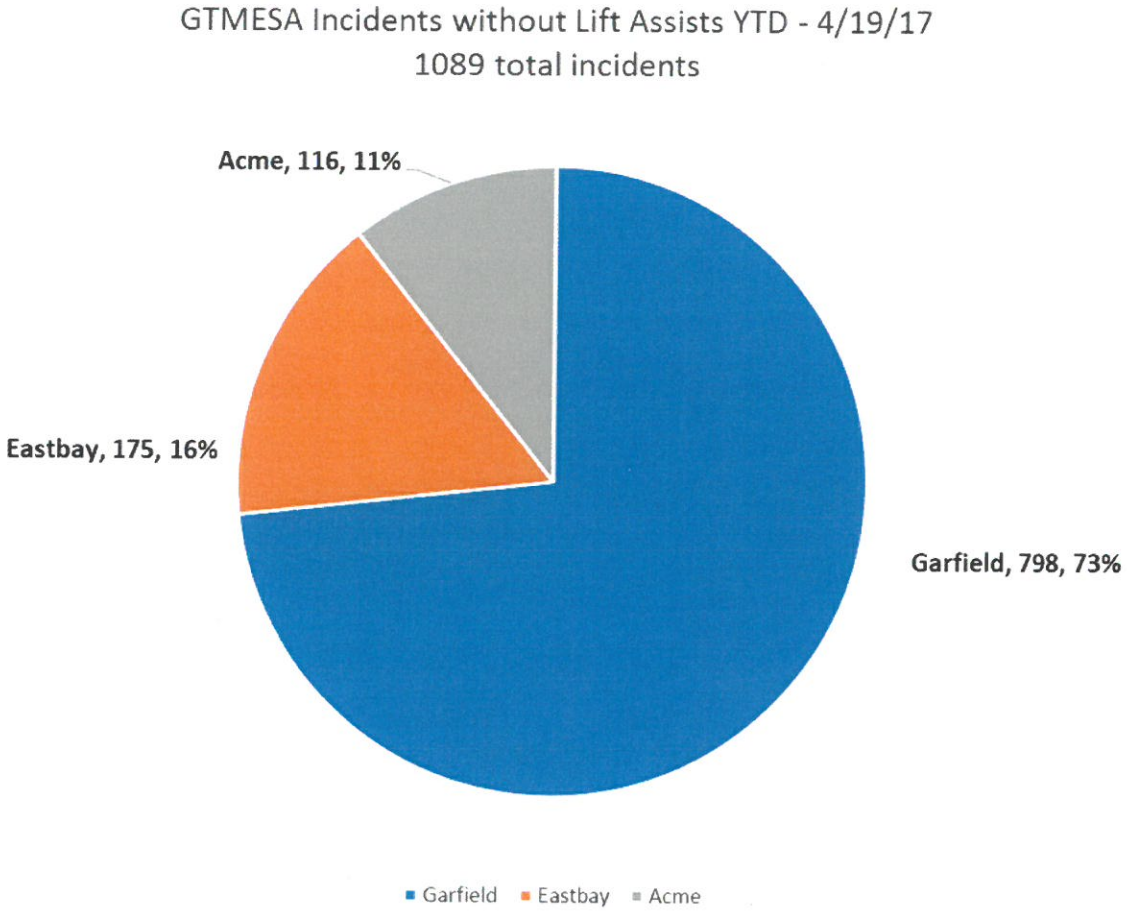
3/22/17 to 4/19/17

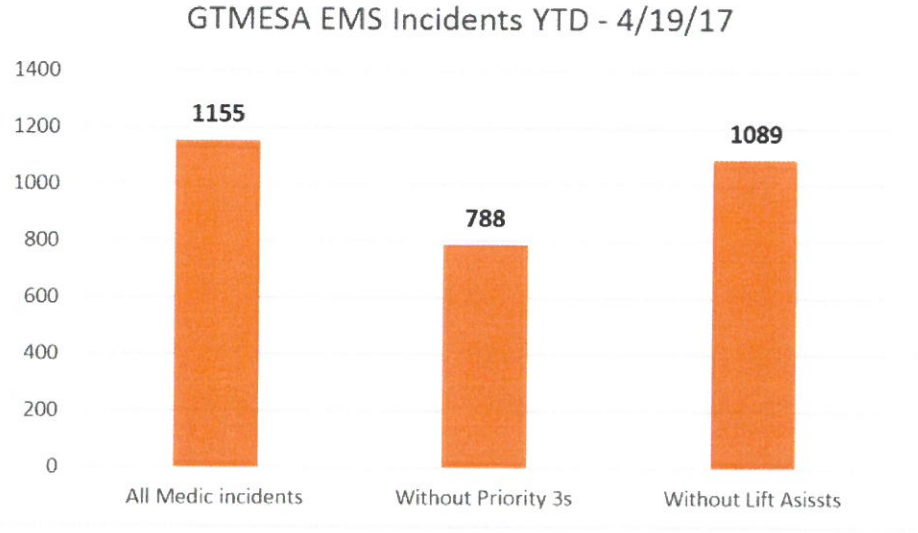



GTMESA All medic incidents YTD - 4/19/17
1155 total incidents
Acme, 123, 11%
Eastbay, 185, 16%
Garfield, 847, 73%
Garfield
Eastbay
Acme

GTMESA without Priority 3 incidents YTD 4/19/ 17
788 total incidents




GTMESA Incidents without Lift Assists YTD - 4/19/17
1089 total incidents
Acme, 116, 11%
Eastbay, 175, 16%
Garfield, 798, 73%
Garfield
Eastbay
Acme


GTMESA EMS Incidents YTD - 4/19/17
1400
1200
1000
800
600
400
200
0
1155
788
1089
All Medic incidents
Without Priority 3s
Without Lift Asissts

**Charter Township Of Garfield**
**Treasurers Report**
**Ending March 31st, 2017**

| Acct. | Unrestricted Funds | General Fund | 12/31/16 | 03/31/17 | Difference | Maturity Date | Rate |
|---|---|---|---|---|---|---|---|
| 7118 | General Fund | Checking | 1,668,555 | 3,145,547 | 1,476,992 | N/A | |
| 5605 | General Chase High Yield | Savings | 168,561 | 168,601 | 40 | N/A | |
| 4670 | *General Fund Managed* | *Invest* | 1,252,396 | 1,275,609 | 23,213 | N/A | |
| 25 | Chemical | CD | 190,684 | 190,684 | - | 6/4/17 | 0.50% |
| 740 | Huntington | CD | 81,479 | 81,479 | - | 10/17/17 | 0.71% |
| 604 | Mbank CD - | CD | 96,278 | 96,278 | - | 9/24/17 | 1.00% |
| 605 | Mbank CD - | CD | 96,278 | 96,278 | - | 9/24/17 | 1.00% |
| 606 | Mbank CD - | CD | 60,807 | 60,807 | - | 9/24/17 | 1.00% |
| S101 | 4-Front Credit Union | CD | 206,728 | 206,788 | 60 | 7/8/17 | 0.65% |
| 300 | NW Consumers CU | CD | 165,908 | 166,235 | 327 | 2/23/17 | 0.80% |
| 332 | NW Consumers CU | CD | 59,245 | 59,362 | 117 | 9/28/18 | 0.60% |
| 662 | Traverse City State Bank | CD | 265,078 | 265,078 | - | 3/12/18 | 0.89% |
| 55 | 1st Community Bank | CD | 211,580 | 211,580 | - | 3/12/18 | 0.75% |
| 72 | First Merit (Citizens) | CD | 250,000 | 250,000 | - | 2/22/19 | 0.90% |
| 15 | First National Bank of America | CD | 256,147 | 257,045 | 898 | 4/14/18 | 1.39% |
| 1 | Team 1 Credit Union | CD | 256,232 | 256,232 | - | 3/2/18 | 1.35% |
| 982 | Credit Union One | CD | 256,965 | 257,916 | 951 | 2/25/18 | 1.50% |
| 119 | Honor Bank *(Purchased from General 5/5/15)* | CD | 252,513 | 252,513 | - | 11/28/19 | 2.02% |
| 40 | Lake Michigan Credit Union | CD | 252,911 | 253,780 | 869 | 8/11/17 | 1.40% |
| | ***Total Unrestricted Funds - Available for Spending*** | | **6,048,345** | **7,551,811** | **1,502,598** | | |

| | Restricted Funds | | Current Month | Current Month | Difference | Date | |
|---|---|---|---|---|---|---|---|
| 7118 | Park Fund | Checking | 509,171 | 633,541 | 124,370 | N/A | |
| 7118 | Roads | Checking | 597,085 | 597,085 | 0 | N/A | |
| 8728 | Fire Fund | Checking | 149,365 | 149,384 | 19 | N/A | |
| 4654 | *Fire Fund Managed* | *Invest* | 763,645 | 776,058 | 12,413 | N/A | |
| 7134 | Receiving Fund | Checking | 3,555,666 | 3,790,743 | 235,077 | N/A | |
| 6025 | Chemical Receiving Fund CD | CD | 1,003,691 | 1,003,692 | 1 | 6/22/2017 | 0.70% |
| 4662 | *Receiving Fund Managed* | *Invest* | 7,524,632 | 7,582,417 | 57,785 | N/A | |
| 7940 | *DPW Fund Managed* | *Invest* | 107,827 | 108,002 | 175 | N/A | |
| 7126 | Tax Fund | Checking | 2,226,070 | 34,236 | (2,191,834) | N/A | |
| 4750 | General Employee Flex | Checking | 2,474 | 2,474 | - | N/A | |
| 3734 | Retirement Rec Fund | Checking | 92,754 | 91,804 | (950) | N/A | |
| 2343 | Insurance Funding | Checking | 375,744 | 375,796 | 52 | N/A | |
| 8681 | Trust & Agency | Checking | 193,451 | 202,750 | 9,299 | N/A | |
| 1111 | Special Lights | Checking | 8,897 | 26,817 | 17,920 | N/A | |
| 3801 | Special Milfoil/Water/Sewer/Roads | Checking | 18,587 | 33,972 | 15,385 | N/A | |
| | ***Total Restricted Funds - Restricted Use*** | | **17,129,059** | **15,408,773** | **(1,720,286)** | | |

| | | | | |
|---|---|---|---|---|
| **TOTAL** | **$ 23,177,404** | **$ 22,960,584** | **$ (217,689)** | * |

** General Fund Checking - Increase due to Tax Income.*
** Park Checking Tax Income*
** Tax Checking - Normal reduction final payments to taxing authorities.*
** Special Lights & Milfoil - Increase do to Tax Collections.*

Respectfully Submitted:

Jeane Blood Law 4/10/17

Jeane Blood Law, Treasurer

# Bid Results
# Charter Township of Garfield
# Potable Water Storage Tank
# GFA Project No. 16037

| | | | | Bluewater Eng Storage Tank | | Tank Connection | | DN Tanks | | American Structures | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Item | Unit | Est. Qty. | Unit Price | Item Cost | Unit Price | Item Cost | Unit Price | Item Cost | Unit Price | Item Cost |
| 1 | Mobilization/Bonds/Insurance | LS | 1 | $64,000.00 | $64,000.00 | $20,000.00 | $20,000.00 | $16,300.00 | $16,300.00 | $24,605.00 | $24,605.00 |
| 2 | Excavation including installation of site piping and accessories (witnin 15' perimeter of tank) | LS | 1 | $115,000.00 | $115,000.00 | $113,423.00 | $113,423.00 | $109,100.00 | $109,100.00 | $80,800.00 | $80,800.00 |
| 3 | Foundation | LS | 1 | $140,000.00 | $140,000.00 | $124,195.00 | $124,195.00 | $74,900.00 | $74,900.00 | $204,148.00 | $204,148.00 |
| 4 | Tank Installation | LS | 1 | $307,700.00 | $307,700.00 | $428,186.00 | $428,186.00 | $710,800.00 | $710,800.00 | $617,540.00 | $617,540.00 |
| 5 | Disinfection/Testing | LS | 1 | $6,500.00 | $6,500.00 | $5,000.00 | $5,000.00 | $4,500.00 | $4,500.00 | $3,500.00 | $3,500.00 |
| 6 | Site Restoration and Grading | LS | 1 | $10,000.00 | $10,000.00 | $10,000.00 | $10,000.00 | $19,400.00 | $19,400.00 | $20,260.00 | $20,260.00 |
| | **TOTAL BIDS (STANDARD)** | | | | **$643,200.00** | | **$700,804.00** | | **$935,000.00** | | **$950,853.00** |
| | **TOTAL BIDS (FOREST GREEN)** | | | | **$651,400.00** | | | | | | |
| | **TOTAL BIDS (BLUE, TAN, WHITE)** | | | | **$675,800.00** | | | | | | |
| | **TOTAL BIDS (TAN)** | | | | **$639,700.00** | | | | | | |
| | **TOTAL BIDS (CORBEL/BRICK BAND)** | | | | | | | | **$950,300.00** | | |

| | DN TANKS, INC | BLUEWATER ENGINEERED STORAGE SYSTEMS |
|---|---|---|
| **GENERAL** | | |
| Company Location | Global facilities been in business for 80 years (closest is Boston, MA) | MI Licensed Dealer for CST<br>CST global facilities been in business for 67 years (closest is Dekalb, IL) |
| AWWA Specification | D110 TYPE III | D103-09 |
| Tank Material | Wirewound, prestressed concrete | Aquastore Glass-Fused-to-Steel bolted steel |
| Tank Dimensions | 80'x31.6' | 78.33'x33.01' |
| Nominal Capacity | 1.1 MG | 1.1 MG |
| **SUBMITTAL REQUIREMENTS** | | |
| Illustrations | Yes, Very Detailed Construction Sequence Drawings | Yes, General |
| References | Yes, Ranging from 0.5 to 5 MGD Water Storage Tanks in MI | Yes, Ranging from 0.5 to 5 MGD Water Storage Tanks in MI |
| Subcontractors | Yes: Elmers (Pipe) | Yes: Elmers (Pipe) / Davis Construction (Concrete) |
| Acknowledgemnet of Addendum #1 | Yes | Yes |
| Schedule | Yes | |
| Proof of Ability to be Bonded | Yes | Yes |
| Insurance | Yes | Yes |
| **TANK CONSTRUCTION** | | |
| Interior Side Coating | None | Coating of oxide, white and blue glass: 10-16 mil |
| Interior Bottom Coating | None | Coating of oxide, white and blue glass: 10-16 mil |
| Exterior Coating | One (1) Coat to Dome and two (2) to sides with Tnnmscoat, Color by Owner | Oxide and blue (or green glass): 6 - 11 mils |
| Roof Vent | Yes Aluminum | Yes |
| Roof Access Hatch | Yes: 2- 3'-6" Square (aluminum) | Yes: 2- 30" Diameter |
| Sidewall Access | Yes: 1 - 25" Diameter (S.S.) | Yes: 1 - 24" Diameter |
| [illegible] Mixing System | Yes | Yes |
| [illegible] | 16" (Concrete Encased / Waterstop) | 16" |
| Outlet | 12" (Concrete Encased / Waterstop) | 12" |
| Overflow | 16" Diameter w/ Internal 1'-8" x 2' Weir | 12" Diameter |
| Floor Drain | Yes: 16" into 4' Diameter Sump | Yes |
| Interior Ladder | None | None |
| Exterior Ladder | Yes: Aluminum | Yes: Aluminum |
| Roof Handrail | Yes: 3'6" Tall (Aluminum) | Yes: 3'6" Tall (Aluminum) |
| Cathodic Protection | Not Applicable | Yes |
| Foundation excavation included | Yes | Yes |
| Soil bearing capacity | 3,000 psf | 3,000 psf |
| **SCHEDULE / TESTING** | | |
| Delivery and freight included | Yes | Yes |
| Tank unload at site included | Yes | Yes |
| Site disinfection included | Yes | Yes |
| Leak Testing | Yes | Yes |
| Shop Drawing Schedule | Completed June 17 | |
| Fabrication and Delivery Schedule | All fabricated onsite with local concrete / materials | |
| Erection Schedule | Completed October 25th | NO SCHEDULE |
| **WARRANTY / MAINTENANCE** | | |
| One Year Materials & Coating Defect Warranty | Yes | Yes |
| **Five** Year Material & **Coating** Corrosion **Warranty** | Not Applicable | Yes |
| Sealed Calculations and Drawings Included | Yes | Yes |
| Performance, Payment & Maintenance Bond | Yes | Yes |
| 30 Year Maintenance Budget (excluding mandatory cleaning, inspection) | None | ~$9,500 every 10 years to replace cathodic protection<br>~$18,000 every 25 years to Reseal / Recaulk<br>(Budget Annually $1600) |
| Service Life | 80+ years | 50 Years |
| [illegible] Responsibilities | Provide onsite water, **Tank contractor construction Gravel Drive** | onsite water / property access (existing) |
| **COST (STANDARD)** | **CONCRETE $935,000.00** | **COBALT BLUE $643,200.00** |
| **COST (ALTERNATE COLOR)** | **CORBEL FOR BRICK BAND $15,300.01** | **FOREST GREEN $651,400.01** |
| | | **SKY BLUE, TAN $675,800.01** |

| | AMERICAN STRUCTURES INC | TANK CONNECTION |
|---|---|---|
| **GENERAL** | | |
| Company Location | Menomonie, WI | Global facilities been in business for 80 years (closest is Kansas) |
| AWWA Specification | Unknown | D103 |
| Tank Material | Bolted, Stainless Steel w/ Aluminum Dome | Fusion |
| Tank Dimensions | 80'x36' | 80'x35' |
| Nominal Capacity | 1 MG | 1 MG |
| **SUBMITTAL REQUIREMENTS** | | |
| Illustrations | Yes, Genersal | Yes, Genersal |
| References | Yes, Ranging in size however NONE in MI | Yes, Ranging in size however NONE in MI |
| Subcontractors | Not Received | Not Received |
| Acknowledgemnet of Addendum #1 | Yes | Yes |
| Schedule | Yes | Not Received |
| Proof of Ability to be Bonded | Yes | Yes |
| Insurance | Not Received | Not Received |
| **TANK CONSTRUCTION** | | |
| Interior Side Coating | Not Applicable | Epoxy, 5 mil |
| Interior Bottom Coating | Not Applicable | Epoxy, 5 mil |
| Exterior Coating | Not Applicable | Epoxy, 5 mil |
| Roof Vent | Yes | Yes |
| Roof Access Hatch | Yes: 1 - 30" Diameter | Yes: 1 - 30" Diameter |
| Sidewall Access | Yes | Yes |
| Mixing System | Yes | Yes |
| | 16" | 16" |
| Outlet | 12" | 12" |
| Overflow | 12" Diameter | 12" Diameter |
| Floor Drain | Yes | Yes |
| Interior Ladder | None | None |
| Exterior Ladder | Unknown | Unknown |
| Roof Handrail | Unknown | Unknown |
| Cathodic Protection | Unknown | Unknown |
| Foundation excavation included | Yes | Yes |
| Soil bearing capacity | 3,000 psf | 3,000 psf |
| **SCHEDULE / TESTING** | | |
| Delivery and freight included | Yes | Yes |
| Tank unload at site included | Yes | Yes |
| Site disinfection included | Yes | Yes |
| Leak Testing | Yes | Yes |
| Shop Drawing Schedule | Completed May 17th | NO SCHEDULE |
| Fabrication and Delivery Schedule | Completed June 7th | |
| Erection Schedule | Completed August 1st | |
| **WARRANTY / MAINTENANCE** | | |
| One Year Materials & Coating Defect Warranty | Yes | Yes |
| Five Year Material & Coating Corrosion Warranty | Yes | Yes |
| Sealed Calculations and Drawings Included | Yes | Yes |
| Performance, Payment & Maintenance Bond | Yes | Yes |
| 30 Year Maintenance Budget (excluding mandatory cleaning, inspection) | None | ~$165,000 every 25 years to Repaint (Budget Annually $5,500) |
| Life | 50 Years | 50 Years |
| er Responsibilities | onsite water / property access (existing) | onsite water / property access (existing) |
| **COST (STANDARD)** | **$950,853.00** | **$700,804.00** |
| **COST (ALTERNATE COLOR)** | | |

BLUEWATER
Engineered Storage Systems

# DESIGN - BUILD - SERVICE

## Complete Storage Solutions

• Standpipes • Reservoirs • CETs

- Municipal Water & Wastewater
- Industrial Water & Wastewater
- Aerobic Digesters
- Anaerobic Digesters
- Leachate

## BLUEWATER ENGINEERED STORAGE SYSTEMS

Bluewater Engineered Storage Systems designs and builds storage systems for municipal and industrial markets in the state of Michigan. Leading edge technology, engineering support and sound construction methods — along with innovative designs and expertise — allow Bluewater to build to the customer's specifications. The right tank, coating and aluminum cover options for your storage application.

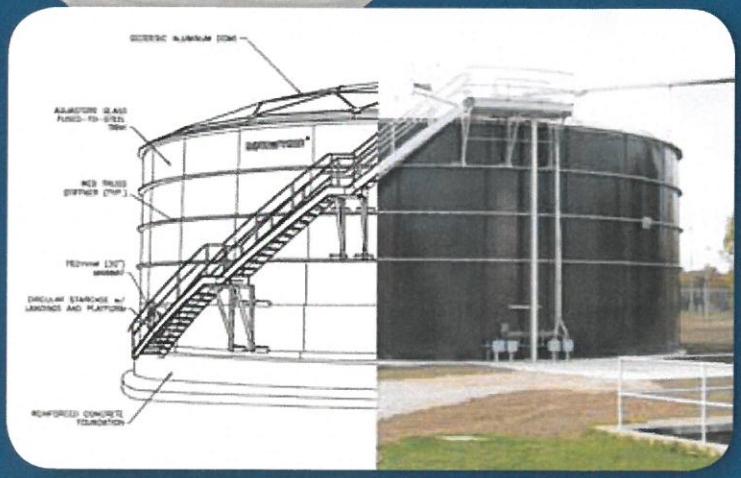
BLUEWATER ENGINEERED STORAGE SYSTEMS is the authorized dealer for CST STORAGE for the state of Michigan. We provide the complete line of Aquastore Glass-Fused-To-Steel and HydroTec tanks and domes for municipal and industrial potable water, wastewater, leachate storage systems and bioenergy solutions.

The Global Leader in Storage Tanks and Covers, CST has developed a strong foundation of dealers throughout North America and the world. They are the complete storage system provider for engineering and manufacturing professionals in thousands of different industries and applications.

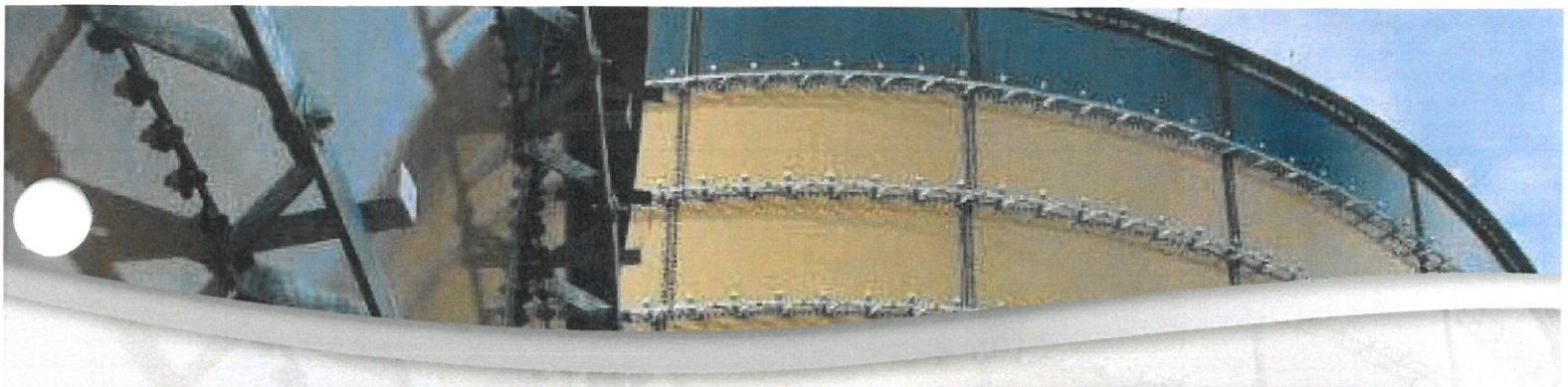
BLUEWATER offers a depth of knowledge and expertise. Through our family of companies we have many years of infrastructure construction experience and qualified, dedicated construction professionals.

BLUEWATER is fully vested in offering the Aquastore and CST Storage products and services, complete with turnkey installation to custom designed projects.

Our post construction support is respected amongst the many customers we have throughout the state.



We are located at:
2000 Town Center, Suite 1900,
[illegible]field, Michigan
[illegible]
Phone: 248-351-9773
Office: 248-351-2699
www.bluewaterstoragesystems.com



## MUNICIPAL AND INDUSTRIAL APPLICATIONS

### POTABLE WATER

- Reservoir Tanks
- Composite Elevated Tanks
- Standpipes
- Chlorine Contact Chambers

### WASTEWATER

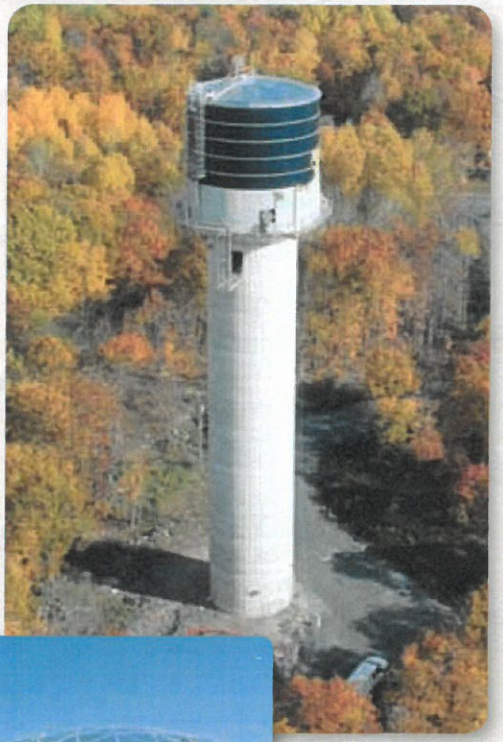
- Biosolids
- Aerobic Digestion
- Anaerobic Digestion
- Leachate
- Clarifiers

### BIOENERGY

- Biogas
- Ethanol
- Biodiesel
- Energy from Waste

### INDUSTRIAL

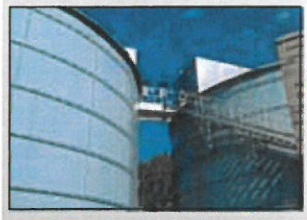
- Fire Protection
- Fracking
- Food & Beverage
- Petroleum and Gas
- UAN
- Mining



BLUEWATER
Engineered Storage Systems

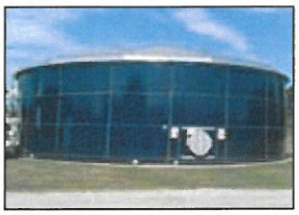
2000 Town Center, Suite 1900,
Southfield, Michigan
48075
Phone: 248-351-9773
Office: 248-351-2699
www.bluewaterstoragesystems.com

Throughout Michigan, we have developed a strong foundation of satisfied municipal and industrial customers. We have over 150 installations, including water, wastewater, leachate and bioenergy tanks, reservoirs and elevated tanks. Some of our tanks are shown below.



Name: Algonac WWTP
Location: ALgonac, MI
Type: Trickling filters

Name: Graceland Fruit Location: Frankfort, MI
Size: 2-36' x 19' SBR, 22' x 19" EQ tank, 34' x 19" EQ tank dome, 59' x 19' domes sludge tank

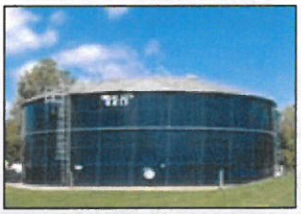


Name: Manistee WWTP
Location: Manistee, MI
Type: 56' x 15' Sludge tank

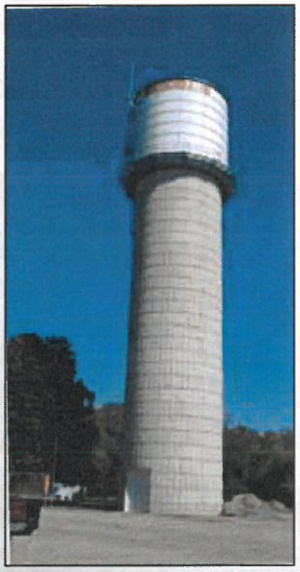
Name: Union Twp. Water
Location: Mt. Pleasant, MI

N East Tawas WWTP
L : East Tawas, MI
Size: 67' x 19' Sludge tank

Name: Water tank
Location: Port Sanilac

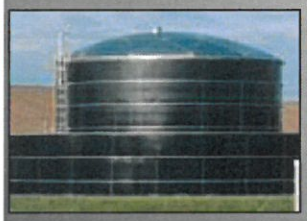


Name: WWTP
Location: Imlay, MI



Type: Composite tank
Location: Marcellus, MI

Name: Walmart Firewater
Location: Greenville, MI
Size



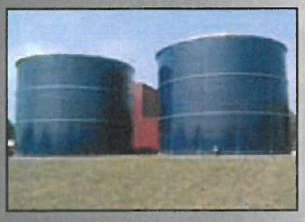
Name: Pine Tree Landfill
Location: Lenox, MI
Size: 46' x 29', 20' x 30' Leachate

Type: WWTP
Location: Jonesville MI
Size: 2-48' x 28' trickling filter

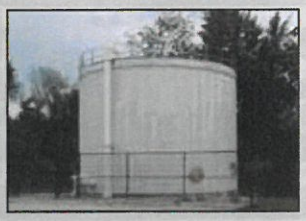
Type: WWTP
Location: Gaylord, MI
Size: Sludge tank

Type: Water tank
Location: East China Twp
Size: 62' x 25'

Type: WWTP
Location: St. John's, MI
Size: 50' x 29'



Name: Leoni WWTP
Location: Jackson, MI
Size: 2-36' x 28'



Type: WWTP
Location: Portgage, MI
Size: Peabody tech tank

Type: Methane digester
Location: Flint, MI
Size: 42' x 28'

CST

# AQUASTORE®

## Glass-Fused-To-Steel Liquid Storage Tanks

CST STORAGE

Steel Gives You Strength

# Glass Gives You Protection

## A LEGACY OF INNOVATION

CST Industries, Inc. has a long and storied history of turning raw steel into the finest storage tanks available. Our unique glass-fused-to-steel technology was introduced more than 67 years ago. Today, CST is dedicated to the design, fabrication and installation of glass-fused-to-steel storage tanks.

After more than 100,000 installations of field proven performance, Aquastore® tanks remain the markets preferred choice for potable water storage and liquid applications. With tens of thousands of satisfied customers, Aquastore tanks are engineered to be the very best.

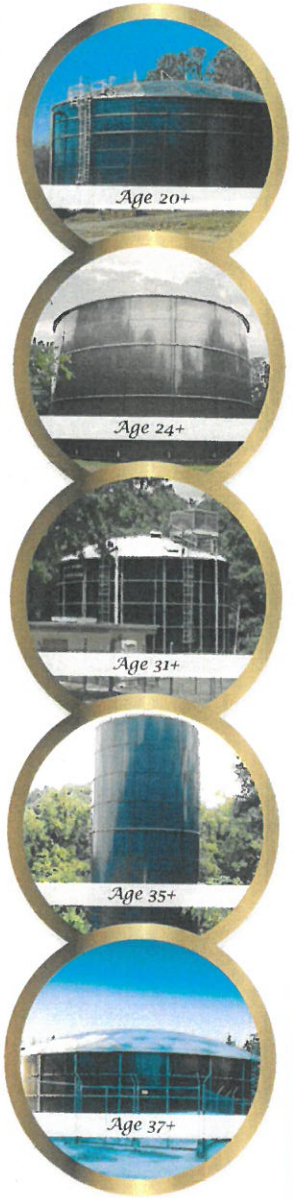
CST has an ongoing research/product improvement program dedicated to constantly enhancing our manufacturing processes. As the leading innovator, CST ensures **Vitrium™ $TiO_2$** and **Edgecoat II™** technology is utilized on every tank for maximum corrosion resistance and the longest life span available. When you purchase an Aquastore, you get the best tank, EVERY TIME.

*With Aquastore, you get the highest engineered quality, best service, longest product life and greatest value in liquid storage tanks.*

**Aquastore owners choose CST's glass-fused-to-steel technology over all other tank designs for several reasons:**

- Never EVER needs painting
- Aquastore tanks are manufactured using Vitrium coating technology enhanced with $TiO_2$
- Edgecoat II technology, the ONLY process in the world that provides optimum glass encapsulation on all (4) four sides of the sheet
- Greater lifetime value compared to other tank designs
- Fastest construction time – Easy assembly without cranes or special equipment
- Expandable to accommodate future requirements
- Available in diameters from 11 feet (3.3 m) to 243 feet (74 m) and capacity from 20,000 gallons (75 cu m) to over 6 million gallons (22,700 cu m)
- Specific tank designs, options and accessories to meet every customers needs
- Lowest life cycle cost of all other available tank designs

*All Aquastore tanks are manufactured exclusively in the USA with only USA steel and supported by the world's most experienced Local Authorized Dealer Network*




» Glass Tanks with a Heart of Steel™

Vitrium™ $TiO_2$

## ENHANCED GLASS-FUSED-TO-STEEL TECHNOLOGY

Aquastore's glass-fused-to-steel is the premium technology in the tank market. Glass coating's physical properties are specially suited to municipal and industrial storage applications. The factory-applied silica glass coating on Aquastore tanks forms a hard, inert barrier for both the interior and exterior tank surfaces to guard against weather and corrosion. Glass-fused-to-steel is impermeable to liquids and vapors, controls undercutting caused by corrosion and offers excellent impact and abrasion resistance. The color won't fade or chalk and graffiti can easily be removed. ***It never needs painting!***

A multi-step process is the heart of the glass-fused-to-steel technology system:

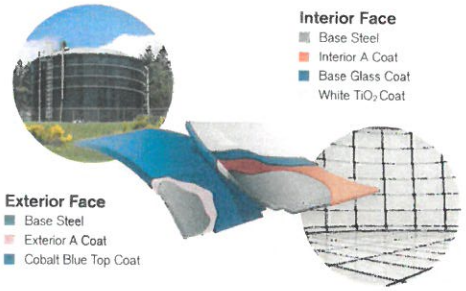
- Fabricated sheets are grit blasted to a uniform, near white surface
- Formulations of borosilicate, minerals, water and clays are blended into a sprayable slurry called "slip"
- After inspection, the slurry is fused to the steel sheets at temperatures above 1500° F (815° C) resulting in an ionic exchange of materials and forming a covalent bond producing the distinctive glossy Aquastore glass finish
- The molten glass reacts with the profiled steel surface to form an inert, inorganic chemical and mechanical bond

*State-of-the-art porcelain enameling furnace improves quality, saves energy, increases production and speeds delivery of glass-fused-to-steel products to customers.*

The interior of ALL Aquastore tanks feature Vitrium™ coating technology enhanced with titanium dioxide ($TiO_2$) for the toughest glass available. This coating combines the outstanding chemical and physical resistant properties of titanium-enhanced glass with a highly engineered, ultra-fine glass bubble structure essential to flexibility, quality and longevity. This process results in high performance glass-fused-to-steel technology. Vitrium features and benefits include:

- Tough $TiO_2$ glass formulations provides longer life
- White interior is easier to inspect than darker coatings
- Factory certified holiday-free sheets
- Designed for use in both cold and hot climates
- Designed, fabricated, shipped and supported within the USA

*Guaranteeing the best quality available from our manufacturing facility to your jobsite.*




*Glass frit is specially formulated to produce the distinctive cobalt blue Aquastore glass coating.*

## ENGINEERED EDGECOAT TECHNOLOGY

**Edgecoat II™** is a result of CST's commitment to an ongoing product development and improvement program. This continuous innovative *Edgecoat II technology is the ONLY process in the world that provides optimum glass encapsulation on all (4) four sides of the sheet edges.* CST took the best Edgecoat technology in the world and made it better with Edgecoat II.

Following Porcelain Enameling Institute guidelines (PEI-101), Edgecoat II sheets are mechanically rounded to specific radii that provides maximum glass adhesion to steel. The combination delivers the maximum corrosion resistance of Vitrium glass coating with the greatest protection on every sheet.

The Edgecoat II engineered approach involves stringent plant quality control procedures to ensure the Edgecoat II remains in place throughout the life of the tank.

Sheet edge corrosion on steel is aesthetically unpleasant and will significantly limit the life of your storage tank. Due to the manufacturing expense and professional engineering necessary to coat the steel edges, other glass tank providers will leave them uncoated and exposed; relying solely on the sealant fillet to prevent corrosion in this area. CST's improved process of mechanically rounding the sheet edges to exact radii ensures adherence of the glass for complete encapsulation on every sheet edge.

Aquastore glass-fused-to-steel tanks with Vitrium $TiO_2$ and enhanced Edgecoat II technology, offer complete encapsulation and corrosion protection. CST continues to lead innovative improvements in areas that are most susceptible to environmental attack.

The physical properties of all Aquastore tanks' glass coating are especially suited to municipal and industrial liquid storage applications. The tank designs incorporate recognized standards assuring high quality long-lasting municipal and industrial liquid storage tanks.

*Engineered Edge*

**Benefits of Edgecoat II include:**

- 5 mils of glass encapsulation on every sheet edge
- Glass is applied on all (4) four sides of the rectangular sheet edges providing the greatest protection
- Edges are engineered to ensure optimum radii for each individual gauge of steel providing the maximum and consistent glass edge
- No sharp edges on tank sheets, eliminating safety hazards
- Highest quality finish

» Edgecoat II™

World-Class Value «

## TANK ECONOMICS & LIFETIME VALUE

All tanks are not created equal! The glass-fused-to-steel technology in an Aquastore tank delivers greater lifetime value than any other tank provider. When you add up the tank benefits over its life cycle, the advantages of an Aquastore cannot be beat. It is simply the best quality, lowest maintenance and most flexible tank available.

### CONSIDERING CONCRETE OR WELDED?

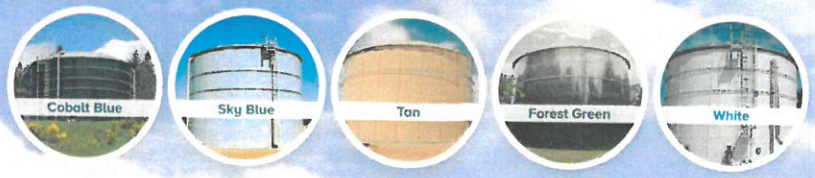
The biggest economic advantage is that an Aquastore tank never needs painting! The budgeted dollars that may be used to repair a concrete tank or repaint a welded tank every 8 – 15 years can be diverted to other municipal or industrial needs. The modular design allows for rapid installation and flexibility when compared to concrete and welded construction.

Concrete tanks are expensive, involve long construction periods, need a lot of room to build and are not "maintenance free". AWWA allows for leaking, and some level of cracking is expected. Concrete tanks require a lengthy construction time compared to an Aquastore tank, especially when expensive concrete roofs are involved and must be field coated to meet NSF approval.

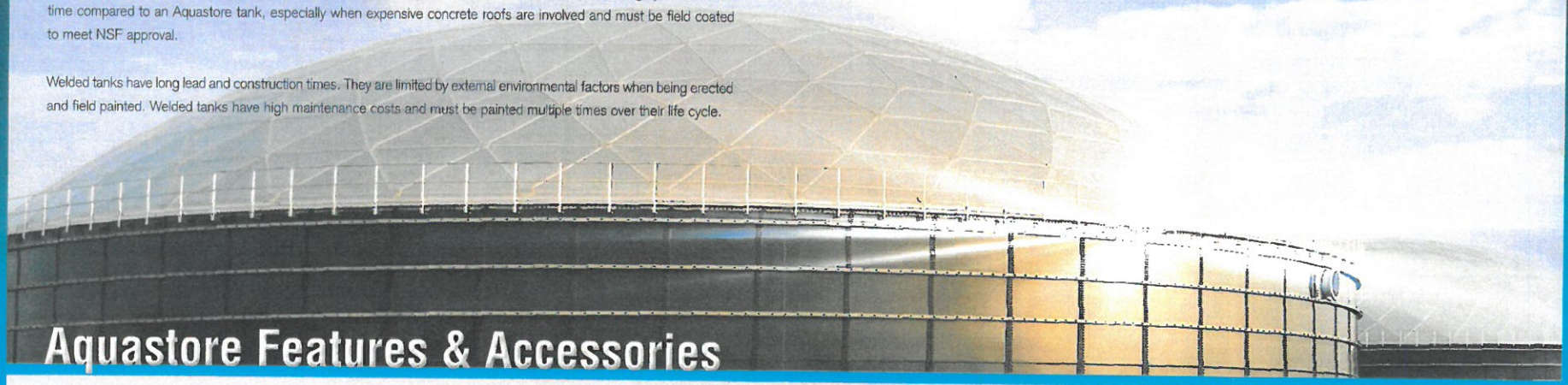
Welded tanks have long lead and construction times. They are limited by external environmental factors when being erected and field painted. Welded tanks have high maintenance costs and must be painted multiple times over their life cycle.

## EXTERIOR COLOR OPTIONS

Aquastore glass coatings are available in standard cobalt blue and four other exterior colors. Inquire for custom colors.




Look for the white interior as a result of the $TiO_2$ coating formula and technology that ensure the maximum corrosion protection for your tank. The white interior provides an added benefit of full visual exposure of your tank during inspections.



# Aquastore Features & Accessories

**Cathodic Protection**

An Aquastore tank's progressive cathodic protection system uses sacrificial anodes to protect the reinforcing bars, mitigate corrosion and provide protection to internal submerged surfaces of the tank. It is incorporated into the Aquastore tank's warranty.

**Gravity Vent**

Aquastore tank gravity vents are designed to allow for air exchange during filling and emptying. They are equipped with corrosion-resistant bird and insect screens.

**Ladder: Cage & Platform**

Aquastore tank ladders are constructed of aluminum rails and rungs with hot-dip galvanized cages and step off platforms. Ladders with locking safety cage doors are available.

**Sidewall Manways**

Aquastore tank manways are designed in accordance with AWWA D103 Standards. They are 24 inches (61 cm), 30 inches (76 cm) or 36 inches (91 cm) in diameter and are manufactured with hot-dip galvanized or stainless steel. Manways are provided with a davit hinge connection for easy access.

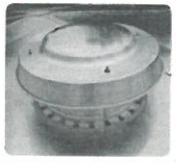
**Hardware and Sealants**

The hardware and sealants are specific to each application. Chlorine resistant sealants, hardware with protective covers and heavy duty plastic bolt caps are also available for added protection.

**Accessories & More**

A variety of accessories are available to meet specific needs. Accessories include:

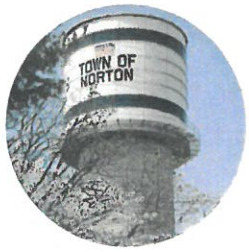
- Roof walkways, railings & staircases
- Level indicators
- Nozzles
- And many more



» World-Class Coatings

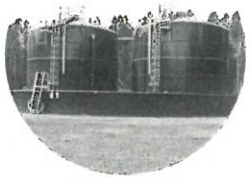
## TANK APPLICATIONS

Aquastore storage tanks with Vitrium glass-fused-to-steel are ideal for the following designs and applications:




**Composite Elevated**

**Standpipe**



**Leachate**

**Ground Storage Tank**

**Fire Protection**

**Anaerobic Digestion**

**Municipal Wastewater**
**Clarifier / Sludge / Storage / Mixing**

## FROM THE TOP DOWN - FASTER, SAFER CONSTRUCTION

Every Aquastore tank is factory engineered to customer specifications. Since all components are manufactured in the factory and easily assembled, Aquastore tanks can be installed in many types of weather conditions that field-welded steel or concrete tanks cannot. Tanks are assembled from the top down by factory trained professional building crews using CST's Proof Load Tested and PE stamped jacking systems that safely and progressively elevate the structure without the need for expensive cranes, large staging areas or extensive scaffolding. Erection crews can stay safely on the ground. This construction method enables rapid, logical progress for timely completion.

- Small footprint
- Site work savings
- Year round construction
- Fast turnaround
- Quick erection
- Trained and certified crews

### Floors

Aquastore floors can be glass-fused-to-steel or reinforced concrete. Steel floors have the same superior glass coating as the Aquastore glass-fused-to-steel sheets. When using concrete, Aquastore walls are embedded in the foundation. Authorized Aquastore Dealers can provide site preparation and foundation installation.

### Sidewalls

Sidewall erection is completed using a series of specially engineered motorized jacks. Each glass-fused-to-steel panel is bolted and sealed into place. Upon completion, the motorized jacks raise the sidewall ring so subsequent rings can be erected. Erecting an Aquastore tank does not require heavy-load cranes or lifting equipment on-site. This unique installation process allows for construction in remote regions, as well as metropolitan areas.

### Roofs or Domes

The flush batten OptiDome® is a next generation aluminum geodesic dome. OptiDome aluminum domes incorporate a flush batten design that effectively sheds water and reduces ponding on the panels. With a Double Web I-Beam customers get the most efficient, functional, long lasting dome solution in the industry. OptiDome is easy to install and requires less sealant than typical geodesic domes. CST's OptiDome design efficiently complies with the latest requirements that have been adopted by 2010 Aluminum Design Manual, Eurocode, and International Building Code 2012.

Every OptiDome is custom designed to meet the specific requirements of each project and can be engineered for any snow, wind or suspended load capacity, as well as span-to-rise-ratio. The all-aluminum free span OptiDome's are available for the complete range of Aquastore tanks.

Glass-fused-to-steel roofs are available up to 31' in diameter and aluminum geodesic domes are available in all sizes.

Glass-fused-to-steel roofs are manufactured with hard tooling and include radially sectioned steel panels. The roofs are assembled using the same sealant and bolting techniques as the sidewall panels.

### Sealants

Aquastore tanks feature sealants specifically formulated for chemical resistance appropriate to the application. Each sealant is inspected on a batch-by-batch basis to ensure quality. The sealant is suitable for contact with potable water and is certified to meet ANSI/NSF Additives Standard 61 for indirect additives and is chlorine resistant. Sealants cure to a rubber-like consistency, have excellent adhesion to the glass coating, low shrinkage and are utilized for both interior and exterior use.

## Authorized Aquastore Dealers «

# Most Experienced Dealer Network

CST delivers Aquastore tanks through a network of Authorized Aquastore Dealers. These organizations and their sales representatives are available to discuss project requirements from inception to completion. Experience in your region and application knowledge are valuable during all stages, from project development to specification to erection to the completed and tested tank.

Pricing, budget estimates, foundation layouts, project scheduling, approval drawings and foundation construction are just a few of the areas where Authorized Aquastore Dealers can help. Our customers deal with one source from start to finish, including service after installation. Dealers provide excellent customer service, are local and knowledgeable of your area and building requirements.


Authorized Aquastore Dealers offer a turn-key package to customers providing service, support and expertise from start to finish. In addition to selling and erecting an Aquastore tank, dealer sales and service specialists provide the following:

- Value engineering – total cost analysis
- Tank configuration and layout data
- Budgeting
- Product engineering specifications
- Design criteria assistance
- Tank layout drawings
- Approval drawings
- Certified drawings
- Site preparation and layout
- Tank construction scheduling
- Structural calculations
- Tank testing and commissioning
- Tank inspection
- Maintenance services
- Relocation or expansion
- Concrete work
- Pipe work (inlet, outlet, overflow, decant, etc.)
- Insulation (spray foam, battens, etc.)
- Dome installations
- Turn-key tank construction
- After sale service

*Turn-key package from site preparation to completed and tested tank.*

## » Best in Industry Warranty

For more than 67 years, CST has offered the most comprehensive manufacturer's warranty in the industry. The field-proven performance history of Aquastore tanks is one more indication that our products are built to last.

An Aquastore tank requires minimal maintenance over its life cycle and CST's Authorized Aquastore Dealers will provide complete service packages tailored to your application needs. Most importantly, the glass-fused-to-steel technology provides protection from environmental impact and never needs painting, saving hundreds of thousands of dollars over time.

*Always there when you need us, just a phone call away...*

*Find your nearest Aquastore Dealer in the dealer locator section at* ***aquastore.com*** *or call* ***815-756-1551*** *today!*

CST is committed to providing its customers with the highest engineered quality, best service, longest product life and greatest value for every storage solution we supply. Contact CST for all of your water, wastewater and liquid applications.

## Worldwide Availability

CST Global Manufacturing and Offices


Certifications and Capabilities:

- ISO 9001:2008
- AISC
- IBC
- Individual State Building Codes
- ANSI/AWWA D103
- NBCC
- FM 4020/4021
- British Standard 7543:2003
- EN 15282/ISO 28765
- NFPA Standard 22
- ANSI/NSF 61

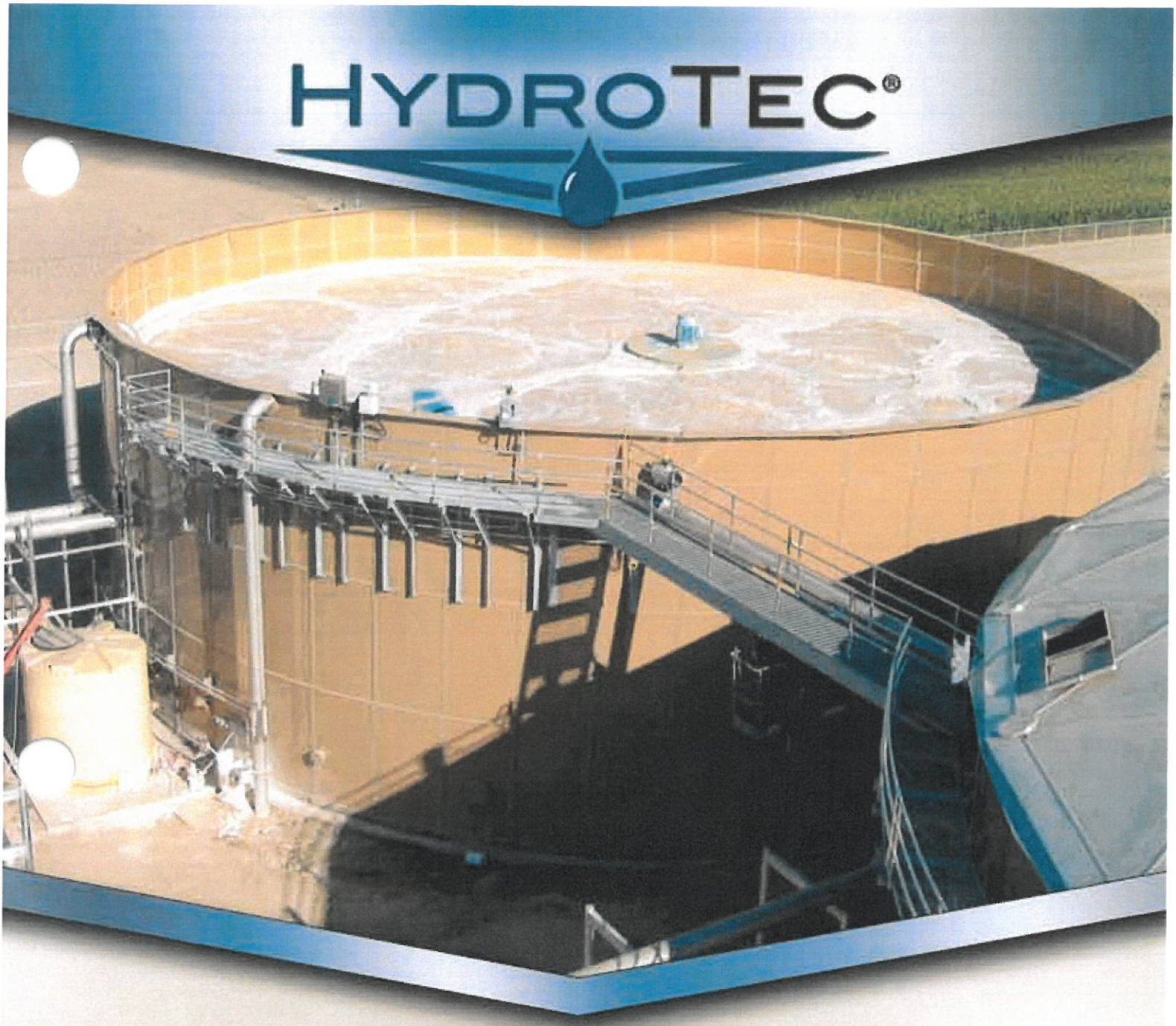
For more information, call **815-756-1551** or visit **aquastore.com** to find an Authorized Aquastore Dealer nearest you.

CST Storage | 345 Harvestore Dr. | DeKalb, IL 60115 USA | Phone: 815-756-1551 | www.aquastore.com



CST STORAGE

AQ-BR-1609




## HydroTec® Tank Systems: If it's water, wastewater or industrial liquids, we've got it covered.

HydroTec® tank systems from CST Storage (formerly Columbian TecTank) are the comprehensive storage solution for any fluid. They are recognized as the industry standard and are specified by the largest engineering firms in the world.

HydroTec tank systems offer experienced, fast and economical construction with a proven track record of storage success. With over 150,000 tanks in 125 countries performing in thousands of applications, no other company can match CST Storage's design, manufacturing and construction experience.

CST STORAGE™

A Division of CST Industries, Inc.

# Designed, manufactured and constructed fast for your specific needs

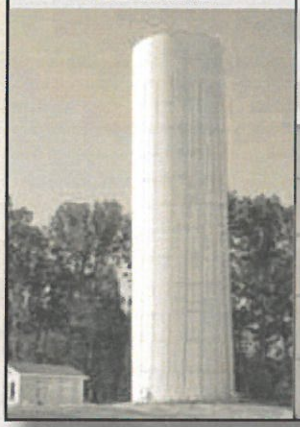
Need a tank that's going to provide premium storage service with low maintenance, and need it now? A HydroTec tank system can be manufactured, erected and in operation up to three times faster than field welded or concrete applications.

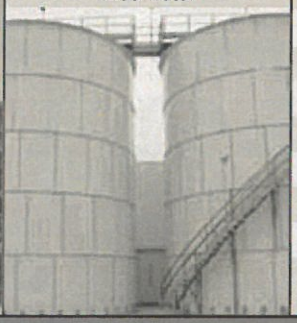
HydroTec tank systems are engineered and fabricated to satisfy your unique specifications. CST Storage (CST) utilizes our own professional engineers who have designed tanks for a wide range of industry specific standards and applications. They are committed to recommending the right HydroTec tank solution for your application.

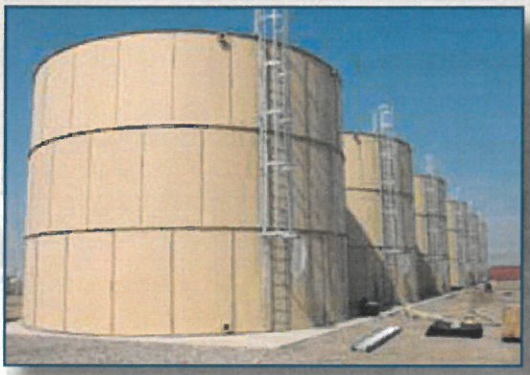
Every HydroTec tank is manufactured in a factory-controlled environment. The result is precise steel panel production teamed with an optimized coating process. CST has invested millions in a completely modernized and automated fabrication line in its ISO 9001 certified facility. This state-of-the-art operation delivers the best epoxy coated steel tanks available in the market.

**HydroTec tank systems are engineered and fabricated for a wide variety of liquid applications, including:**

| WATER | WASTEWATER | INDUSTRIAL LIQUIDS & CHEMICALS |
|---|---|---|
| Potable Water | Flow Equalization | Fertilizer |
| Raw Water Storage | Primary & Secondary Sedimentation | Resins |
| Flocculation | Aeration | Insecticides |
| Filtration | Trickling Filters | Polymers |
| Sludge Storage | Anaerobic & Aerobic Digestion | Food Additives |
| Disinfection | Sludge Storage | Asphalt |
| Fire Protection | Disinfection | Glycols |
| | Leachate | Lubricants |
| | Storm Water Run-off | Lime & Carbonate Slurry |
| | Frac Water | Secondary Containment |
| | | Edible Oils |
| | | Paints & Primers |
| | | Detergents |
| | | Fuel Oils |
| | | Mining Fluids & Slurry |
| | | De-icer |
| | | Dyes & Pigments |
| | | Pulp & Paper Processing |







## High quality at the lowest cost per gallon

After over 100 years of storage solution success, CST has perfected its tanks to be the most economical choice in water and industrial liquid storage without skimping on tank value and durability.

- Low installed up-front costs:
  - The fastest construction available
  - Can be constructed in all weather types without the typical delays common with other technologies
- Longer tank life = lower life cycle costs = quicker ROI:
  - High-quality and durable coatings extend tank life and limit operating maintenance costs
  - The strongest corrosion and abrasion resistance on the epoxy coated market
- HydroTec tank systems are the "Green" choice in liquid storage:
  - No in-field painting or re-painting eliminates harmful silica from sand blasting and paint overspray
  - Minimized construction footprint protects surrounding environment

# Superior coating technology with proven performance

## The CST OptiBond™ Coating System

*CST Storage utilizes proprietary coating technology that provides maximum corrosion resistance and long tank life.* Our experience has led to continuous technology and process improvements. The result is the finest epoxy coating available in the liquid tank industry. The OptiBond™ coating system is derived from years of in-field experience and performance data.

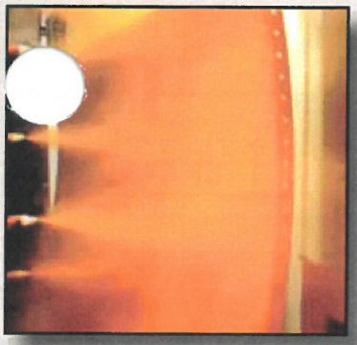
### CLEANING

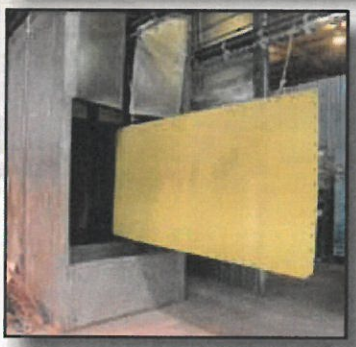
**Stage 1:**

- Parts are degreased and rinsed
- Precisely controlled hot air drying and pre-heating at optimum temperature for a precision coating process

**Stage 2:**

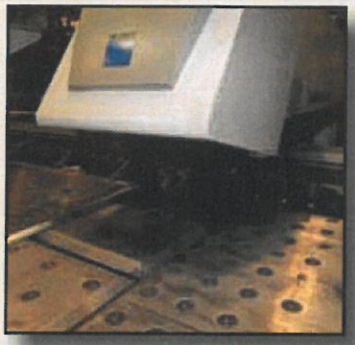
- Parts surfaces are blasted with engineered grit material
- Rugged 3-D surface topography is created for better powder coating acceptance, increasing durability and long-term coating performance
- A high velocity air curtain removes residual particulate

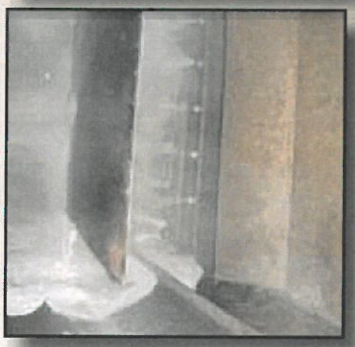




### QUALITY CONTROL

Parts are subjected to a rigorous quality control evaluation with a high voltage defect testing procedure. This will identify any holidays, inclusions and thin areas in the coating. *No other company has a higher process and quality control standard than CST Storage.*





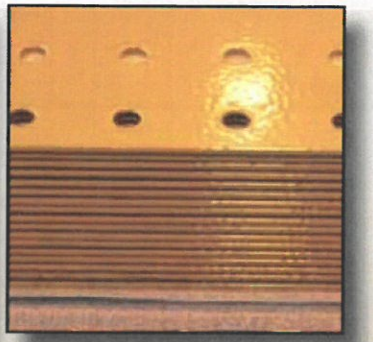
### COATING

**Stage 3:**

- Parts are powder coated in our proprietary Trico Bond EP electrostatic booth with precise environmental controls
- Parts are cured at controlled temperature to maximize the cross-link bonding of the epoxy particles

**Stage 4:**

- Uniquely engineered polyurethane topcoat is applied for UV protection on exterior surfaces for extra durability and longevity
- Sheets are cured at controlled temperature, yielding the final product



## HydroTec Specification Options

| MATERIAL OPTIONS | CAPACITY SPECIFICATIONS | BOTTOM OPTIONS | HARDWARE SPECIFICATIONS |
|---|---|---|---|
| ▾ Factory-coated carbon steel | ▾ Standard diameters available from 9' (2.8m) to 148' (45m) | Steel<br>▾ Flat<br>▾ 1:12 sloped<br>▾ Drop Bottom™ | ▾ Hot-dipped galvanized |
| ▾ Galvanized steel | ▾ Factory welded diameters from 6' to 15' | | ▾ Encapsulated nuts and bolts available |
| ▾ Stainless steel | ▾ Standard designs: AWWA D103-09, NFPA, API, NSF | Concrete<br>▾ Embedded starter ring used | ▾ EPDM gaskets standard |
| ▾ Aluminum | ▾ Standard tank capacities range from 4,000 to 3 million US gallons (15 $m^3$ to 11,000 $m^3$) | | ▾ Specialty gaskets available for high tempertatures or special contents |
| | ▾ Large capacity tanks available | | |

# HydroTec from CST Storage

CST Storage is the global market leader in pre-engineered and pre-fabricated storage tanks for liquid and dry bulk applications. Committed to delivering worry-free solutions, CST Storage is the original innovator and model for all other steel tank companies. No other company can match CST Storage's worldwide experience in design, manufacturing and construction of bolted steel tanks. You can count on CST Storage to be your partner throughout the entire process from specification to quality construction to service.

New process technologies, effective designs and investments in new equipment have raised the CST Storage product offering to a new level. Combine that with experienced and dedicated people, at CST Storage you get more than just a tank. You get field-proven storage solutions and committed service that is right for your specific needs.

HYDROTEC®

COLUMBIAN TecTank

**www.cst-storage.com ▾ sales@cst-storage.com**

CST STORAGE™

**CST Storage**
9701 Renner Boulevard, Suite 150 ▾ Lenexa, KS 66219
Phone: 913-621-3700 ▾ Fax: 913-621-2145

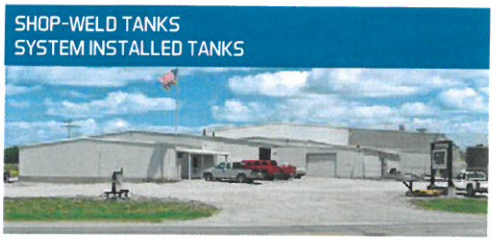
TANK CONNECTION
AFFILIATE GROUP

# SPECIFYING MUNICIPAL WATER TANKS

## ABOUT TANK CONNECTION

In 2003, three founding partners started a company focused on storage tank solutions. Today, Tank Connection Affiliate Group leads the tank industry as the largest global supplier of bolted steel tanks for liquid and dry bulk storage applications. The affiliate group maintains five tank manufacturing facilities and over 500 employees dedicated to the design, manufacture and field installation of above ground storage tank systems. All of their storage tank products are manufactured in the U.S., with shipment and installations worldwide.








## SPECIFYING MUNICIPAL WATER TANKS

***At Tank Connection, we follow a simple formula for success!***

Routinely, we are asked what factors contributed to the company's exponential growth over the last decade. From day one we set our charter that defined our mission, vision and core values. To condense our view, we wanted Tank Connection to focus on listening to clients and providing them with factual information on different types of storage containment options. The marketplace is full of suppliers promoting storage tank products that will not fulfill municipal requirements for long-term field performance. Our approach to service clients is based on the development of a broad product line of superior storage tank products, designs and field construction services. Initially, our product line included bolted, shop-welded and field-welded tank construction. As our company developed, we added hybrid tank designs, aluminum geodesic domes, elevated water tank designs, composite pedestals and other types of containment covers. At Tank Connection, we simply focused our efforts on developing high performance, above ground storage tank systems. Needless to say, over the last decade the industry has responded favorably to our straight forward approach.

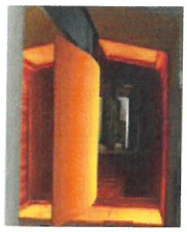
## WHAT PRODUCT ADVANTAGES DOES TANK CONNECTION OFFER IN MUNICIPAL WATER STORAGE?

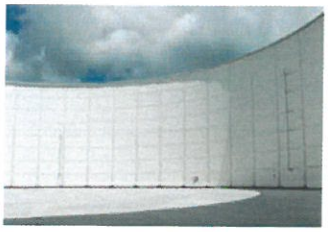
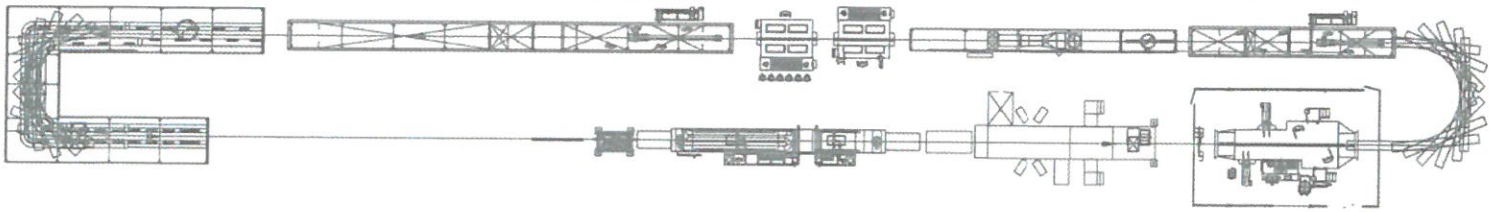
We offer **all types** of steel tank construction including bolted RTP, shop-weld, field-weld, SIT's (system installed tanks) and hybrid tank construction. Our bolted RTP (rolled, tapered panel) tank design has become the #1 bolted tank design selected worldwide. We also offer a variety of specialty storage products including aluminum geodesic domes, flat covers, and elevated water tank designs.

- TC maintains one of the most extensive engineering departments in the tank industry. We have PE's that set on AWWA D103, AWWA D104, AWWA D106 and AWWA D108 committees. Internally, we maintain an expanded listing of PE stamps throughout the U.S.

- We are the exclusive provider of a proprietary coating system developed by Akzo Nobel called LIQ Fusion 7000 FBE™. (Akzo Nobel is the largest powder coating supplier worldwide.) This system is a special epoxy powder coating that is designed for water immersion service. To date, this system has received extensive testing and is proven to be unmatched in performance compared to any other coating system for water storage. It is a stronger system than glass/vitreous enamel in potable water applications. Tank Connection is also the only company certified to apply this system on bolted steel tank panels used in liquid immersion service.



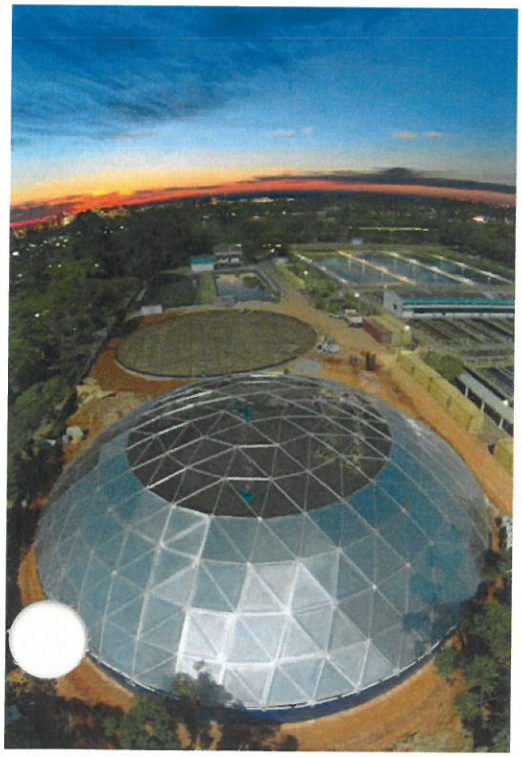
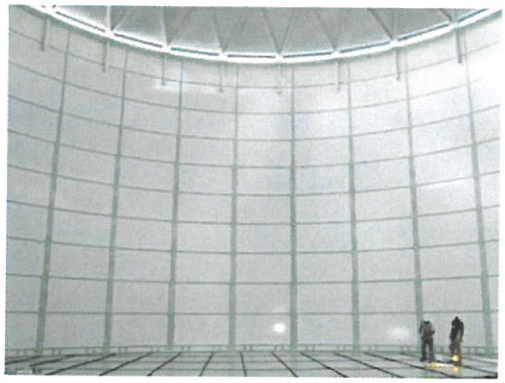


- Our coating application technology is the second part of the coating equation. Our state-of-the-art, high-tech coating process line is over twice the length of a football field and includes 14 stations, 21 stages and over 110 application processes, checks and inspections. This line requires an operations team of 13 people to maintain its automated processes.
- As of March 2015, TC installed a second, even larger, state-of-the-art, high-tech powder coating line. The demand for our coating technology in water storage remains unprecedented, so we are expanding once again to fulfill client's needs.
- In municipal water storage, the premier hybrid bolted tank system, selected for potable water storage, utilizes the best component tank features of coated carbon steel, concrete and aluminum construction. Under review for quality, installed cost, life-cycle cost and safe field construction, this storage tank containment system has proven to be unmatched in water storage applications.

## THE PREMIER BOLTED WATER TANK FOR MUNICIPAL WATER STORAGE INCLUDES:

- Bolted RTP (rolled, tapered panel) tank sidewall
- LIQ Fusion 7000 FBE™ coating system
- Concrete foundation with base setting ring
- Aluminum geodesic dome cover

## IN SPECIFYING A MUNICIPAL WATER STORAGE TANK, WHAT ARE SOME OF THE MAIN FACTORS TO CONSIDER?

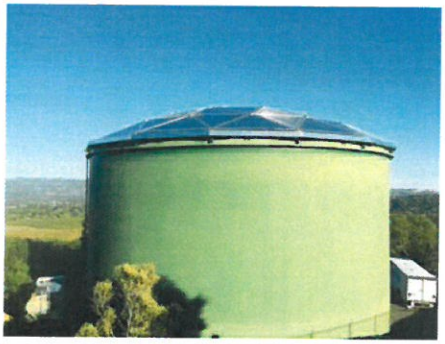
- Always ensure a competitive bid process occurs. NEVER allow a single storage tank product or company to be specified. As an example, some municipal specifiers previously released specifications for a "glass tank only" bid. Since there is only one glass tank manufacturer in the U.S., a competitive bid process to benefit the client has been defeated from the onset. One supplier or one product specified simply equates to a non-competitive bid process.

- In specifying a water tank design, we advise consultants to specify our bolted RTP tank design and LIQ Fusion 7000 FBE™ coating system, along with a glass coating spec and/or a field-weld tank specification. Review the merits of each product and then make your selection.

- In water storage service, we advise clients on tank products that can't be refurbished (i.e., blast, coat and repair) in the future, as limited service life products. Typically, these products maintain the highest life cycle costs for municipal water storage applications.

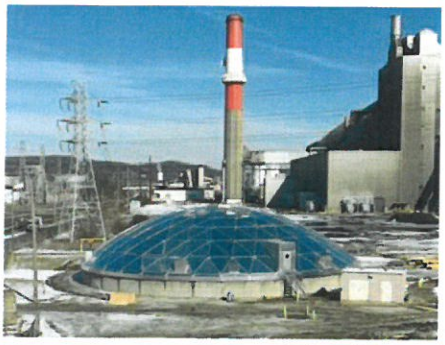
- Web stiffeners, also known as webbies and/or external stiffeners are commonly used on some bolted tank designs. The sole function of a web stiffener is to prevent shell buckling (flattening of shell) during inclement wind conditions. Although allowed by AWWA D103 specification, Tank Connection has objected to their use for some time. We ask a simple question, do you want a water storage tank reinforced with cheap external stiffeners or do you want a water storage tank that incorporates heavier plate thickness? As an example, a web stiffener for a 100' diameter water tank costs ~$900. When a municipal client is spending significant capital funds for a new water tank system, should they expect to receive a tank designed with an erector's set of external stiffeners? At TC, we subscribe the use of heavier plate thickness with no exterior web stiffeners allowed, the same as welded tank construction. It is our view that bolted steel tanks that utilize thin sidewall designs and web stiffeners should not be considered extended service life products for municipal water storage.

- If a welded or bolted water tank is larger than 32' diameter, utilize an aluminum dome cover. Aluminum geodesic domes have become a preferred tank cover in the municipal water market. Aluminum domes are commonly requested today for all types of tank construction including field-welded, bolted and concrete tanks. The merits of the product are easily recognized. These covers are extremely strong and represent high quality containment that is virtually corrosion and maintenance free.



**SAO PAULO, BRAZIL**

These two 140' diameter domes were installed on bolted RTP municipal water tanks.



**NAPA, CALIFORNIA**

This 68' diameter dome was designed, manufactured, delivered and installed in 35 days (total) on this existing field-welded tank.

**ALDRICH, PENNSYLVANIA**

This aluminum dome installed on a low profile concrete tank.

- Safe field construction at any global location. The days of elevating tank workers in the air are over. Tank Connection as well as other suppliers, maintain a special synchronized jacking process that allows large bolted water tanks to be jacked from grade level. We also station these jacks worldwide, which allow bolted water tanks to be safely built at grade level at any location. The examples shown below are municipal water tanks that were jack built from grade level. Additionally, TC has now developed a "patent pending" elevated water tank (EWT) design that can be jack built from grade level.

The water tanks shown below were all jack built from grade level.
The process represents unmatched safety and quality control in the field.

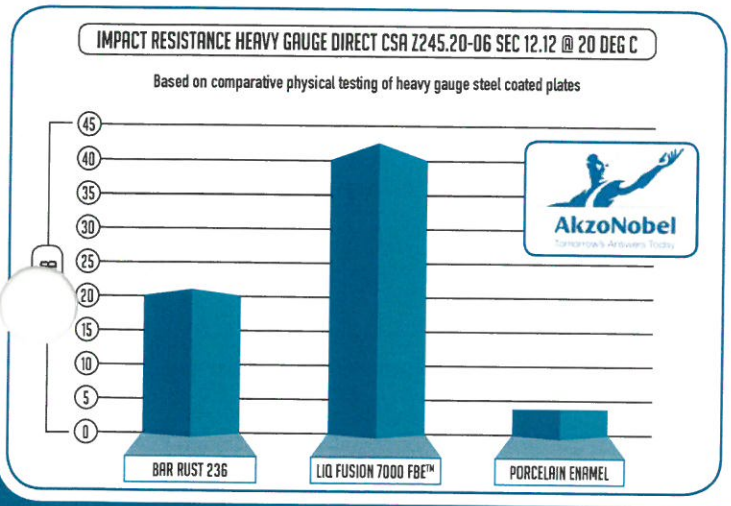
Large diameter low profile

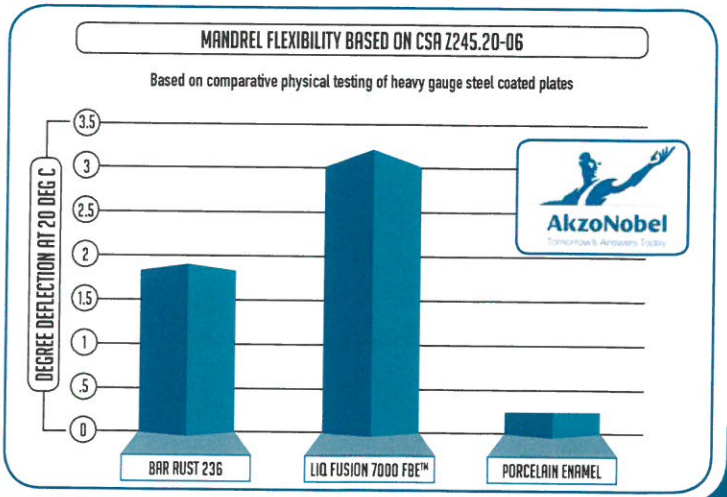
E.W.T profile with elevated floor


Standpipe profile

- Coatings available for bolted and welded water tanks range from poor to high performance systems. As we have noted, the best factory applied coating system that has undergone extensive testing for potable water storage applications was developed by Akzo Nobel, and is called LIQ Fusion 7000 FBE™. Akzo Nobel has also conducted extensive lab testing on other powder coat systems, liquid coatings and glass/porcelain enamel coatings. In potable water storage, glass coatings can provide good panel protection, but they also come with a list of other problems associated with their formulations, uncoated bolt holes and edges, holidays, etc.

Two areas in particular that are of importance in bolted tank construction include coating flexibility and impact resistance. All steel storage tanks, bolted or welded, expand and contract. Relative to bolted tank construction, under FEA analysis the bolted connection area becomes stressed during expansion. In essence, steel is ductile and the coating system selected also needs to be flexible. As noted in lab testing, mandrel flexibility is excellent for select epoxy powder coating systems, but the opposite occurs for glass/vitreous enamel coatings. Again, steel is ductile under stress, but glass coatings are brittle. The area of concern is in the bolt connection region where the glass coatings can crack. A coating failure in this area can create a corrosion point. In 2014, two glass tanks incurred failure in municipal water service due to corrosion in the bolt connection area.



In summary, municipal water tank systems are available in today's market ranging from low to high performance systems. There are four variables in the selection of high quality water containment systems. This includes the quality of tank design, fabrication, coatings and field construction services. Clients tell us routinely that it is difficult to sort through the barrage of blurred promotion offered by some suppliers. Our response is consistent in advising them to always separate real facts from promotion rhetoric on storage tank products under review. In today's market, factual R&D testing is available on any coating system and tank design. Request the back-up data, review it and then hold vendors accountable in their warranties for the product claims made. The market is well served only when vendors listen to their clients and deliver storage containment products that fulfill or exceed their expectations.


ISO 9001:2008
Certificate Number: 45729

Tank Connection is an ISO 9001 certified company. TC leads the storage industry in application expertise, storage innovation and solutions, storage tank manufacturing technology, vertical integration of operations and field construction services. When you specify Tank Connection, you have selected the top performance storage systems and field construction services available globally.

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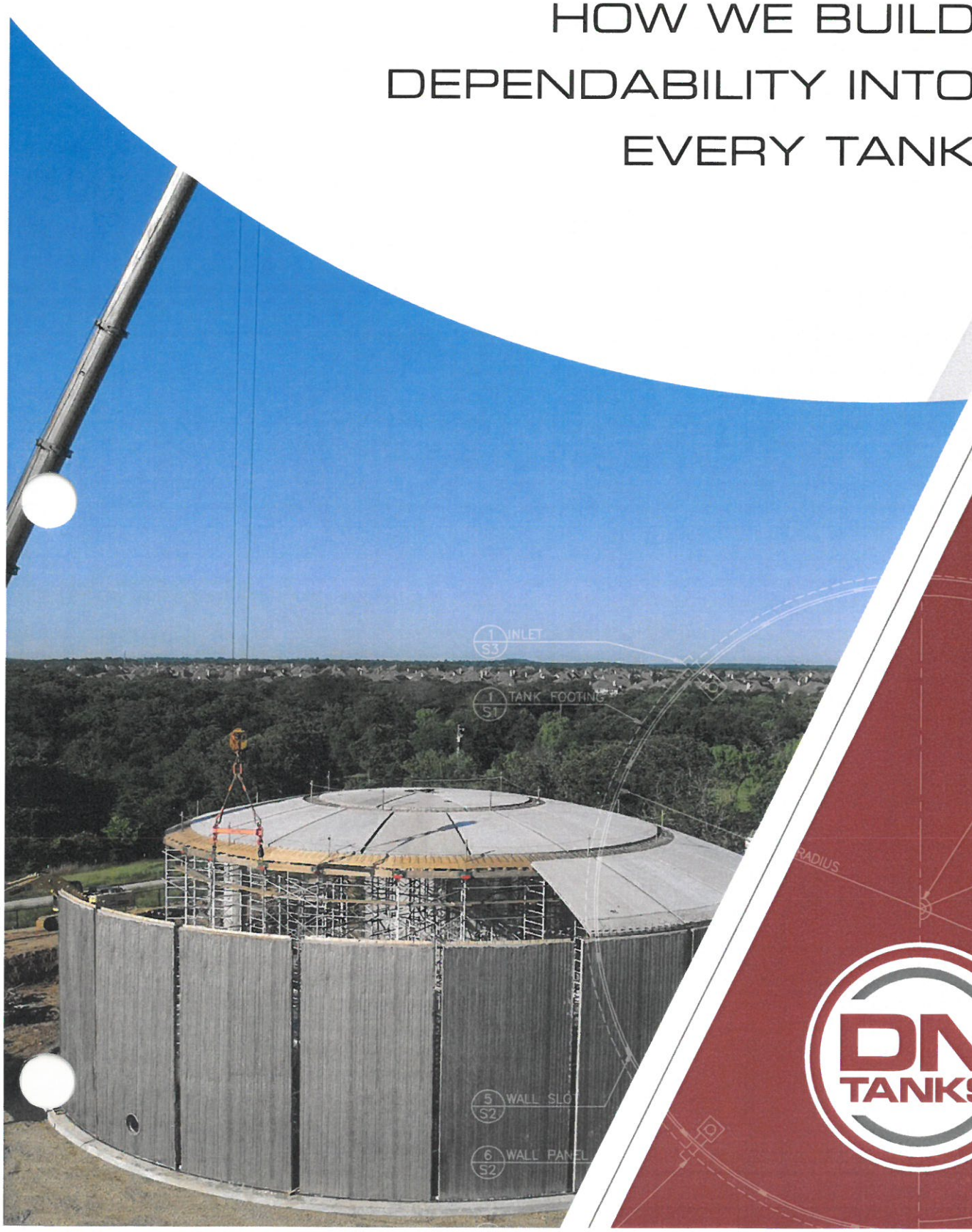
TANK CONNECTION AFFILIATE GROUP
Liquid Tanks.com
BOSS Tank The Storage Authority
Alliance Constructors
AluminumDomes.com

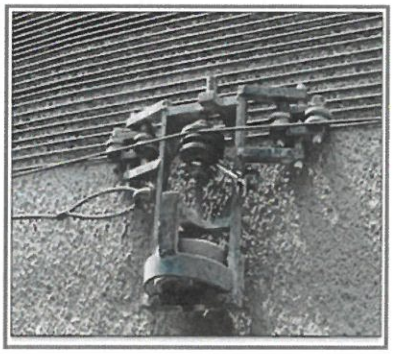
# HOW WE BUILD DEPENDABILITY INTO EVERY TANK

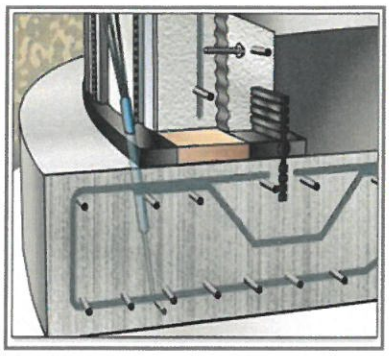



DN TANKS

DN TANKS®

Generations Strong





# FEATURES AND BENEFITS

## Embedded Steel Diaphragm

*Combines best features of steel and concrete tanks, provides assurance of water tightness*

## Wire-wound Prestressing

*Multiple layers of bonded wire prestressing for safety and redundancy*
*Visual confirmation of prestressing and full shotcrete encasement*

## Freestanding Concrete Dome

*Long term, water tight, durable roof structure*

## Cold Region Design

*Tank structure designed for all environmental conditions, including ice formation, without operating limitations*

## Lowest Cost of Ownership

*Eliminates the need to budget for future maintenance*

## Investment in Local Economy

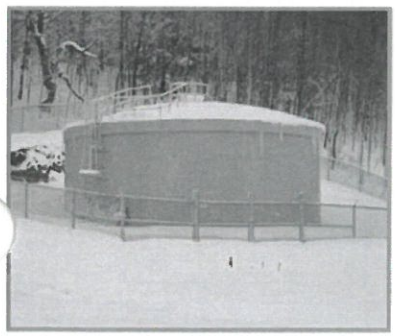
*Tank constructed utilizing local materials, labor, and equipment.*
Typically, **65% of the total construction cost is immediately reinvested in the local economy**.

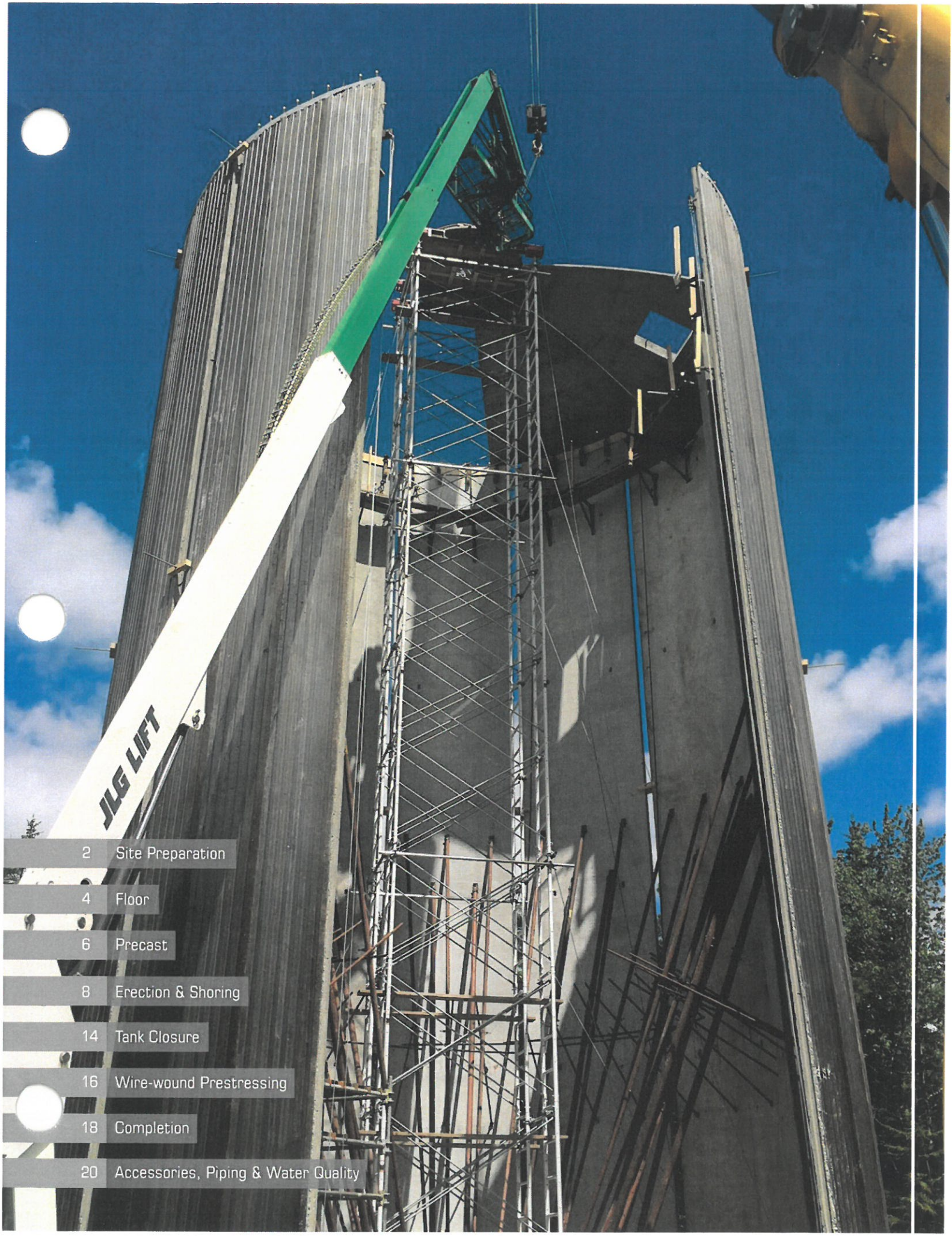
## Coatings and Sealants Not Required

*Water-tightness is assured with integral tank features, not dependant on coatings*

## Durable Tank Design

*Not susceptible to impact damage, vandalism and severe weather*





# DN TANKS MEANS DEPENDABILITY.

## Our tanks are constructed with precast concrete walls, an embedded steel diaphragm, and wire-wound prestressing to provide decades of trouble-free, dependable service.

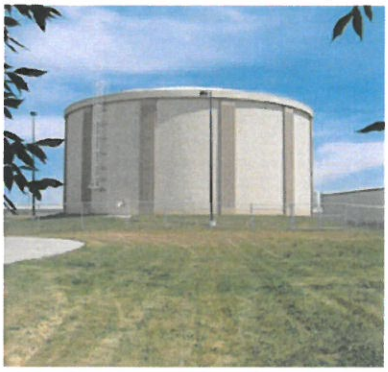
Our tanks are built in accordance with AWWA Standard D-110, Type III. With over 80 years of experience, DN TANKS has designed and constructed tanks ranging from 40,000 gallons to 40 million gallons and larger. We have successfully constructed tanks on all types of terrain, in all types of climates, in every imaginable site condition. Some of our tanks blend naturally with the environment; others finished with creative architectural treatments become popular landmarks in the community.

Each tank is built on site by DN TANKS construction specialists, directed by a DN TANKS project manager and a DN TANKS superintendent. But DN TANKS is not just a tank contractor.

DN TANKS provides a team of design engineers, estimators, project managers, construction field personnel, and quality control engineers to work with you and your consulting engineer. Most importantly, DN TANKS is a true partner with its clients.

We provide single-party responsibility for all aspects of tank design and construction. DN TANKS provides investment in your community by using local materials, labor, and equipment.

DN TANKS. We build dependability into every tank. Now here's how we do it step by step.



# SITE PREPARATION

Site work and foundation preparation are in accordance with the site plan and the geotechnical report prepared by a licensed geotechnical engineer, which provides the bearing capacity, anticipated settlements, and recommended foundation preparation.

- Site clearing and general excavation are undertaken in preparation for tank construction.
- The exposed subgrade is proof-rolled and tested for conformance with the geotechnical report. Select granular fill is placed, if required, for drainage or where unsuitable material is present. The leveling base granular material is then put down in layers and compacted to meet foundation requirements.
- Site preparation includes creating an access roadway around the tank at floor elevation as well as level areas adjacent to the tank for wall and dome casting beds. The casting beds are located near the tank to allow the wall and dome panels to be erected into place.

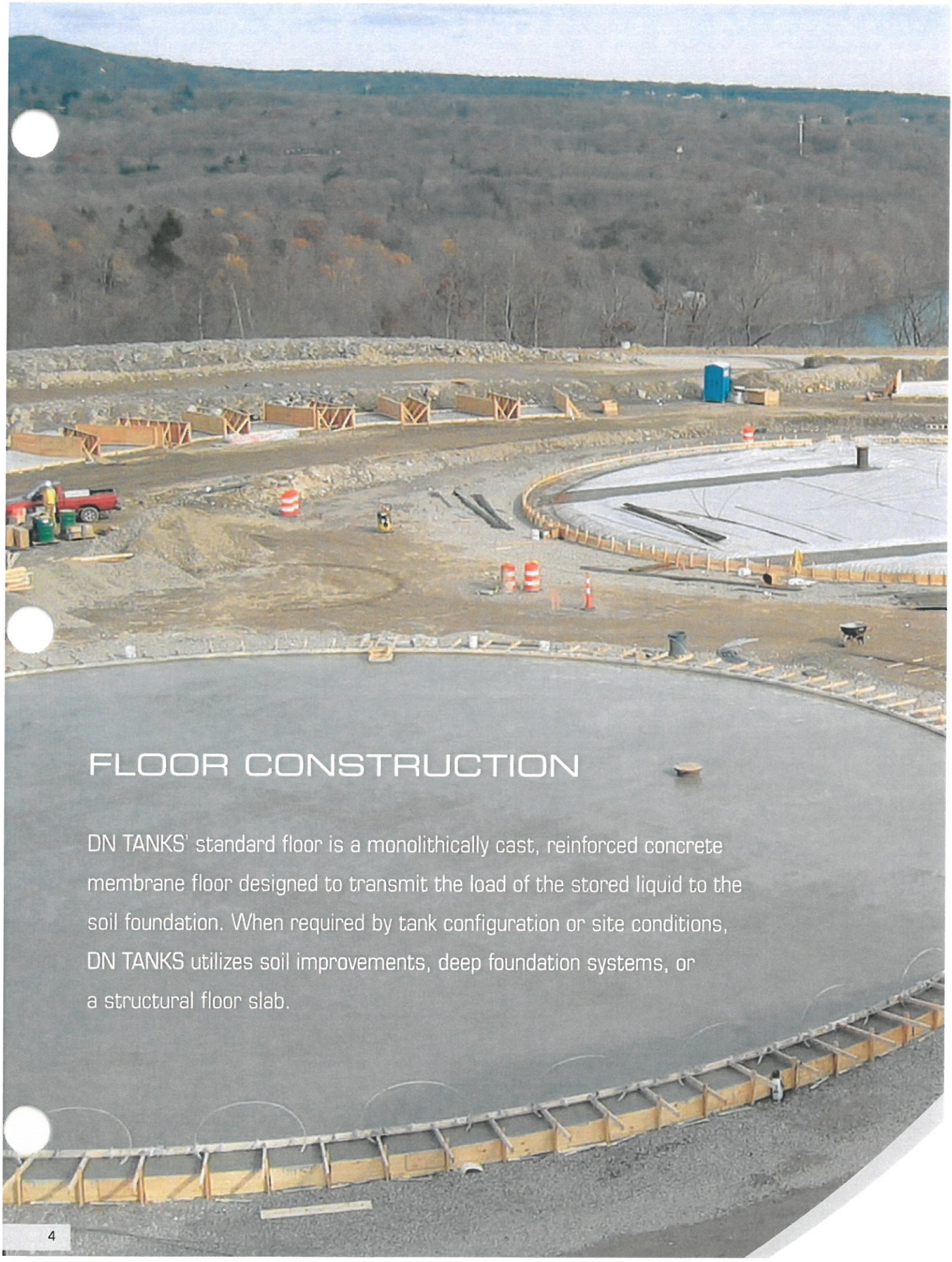
EXCAVATION

SUBBASE PLACEMENT


- Subgrade preparation for each project is customized based on local soil conditions.

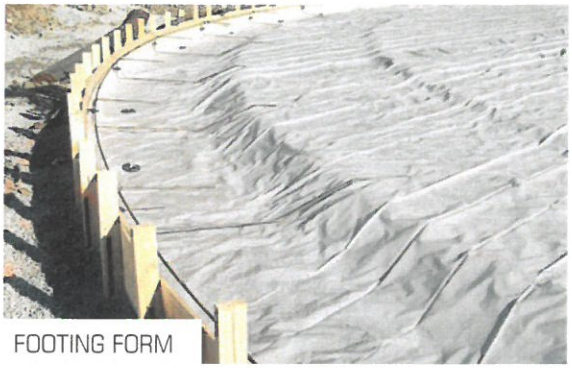
COMPACTION OF SUBBASE

LEVELING BASE COURSE

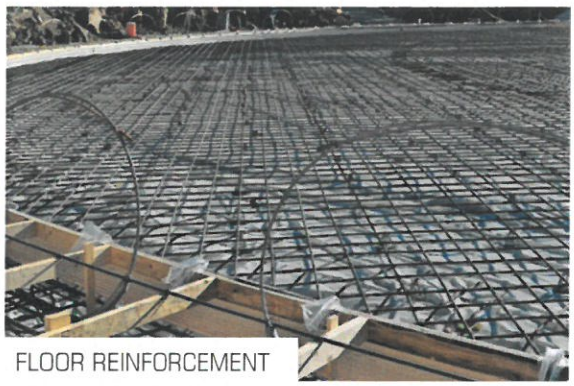


# FLOOR CONSTRUCTION

DN TANKS' standard floor is a monolithically cast, reinforced concrete membrane floor designed to transmit the load of the stored liquid to the soil foundation. When required by tank configuration or site conditions, DN TANKS utilizes soil improvements, deep foundation systems, or a structural floor slab.



FOOTING FORM



FLOOR REINFORCEMENT

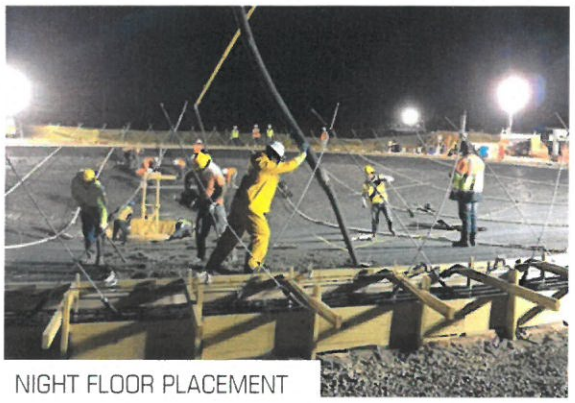
CONCRETE PLACEMENT

- Footing forms are constructed around the tank perimeter. A PVC waterstop is vertically suspended for partial encasement in the slab.

- Reinforcing steel and base restraint cables are installed in the floor and footing.

- Concrete is now ready to be placed in the floor where it is vibrated, screeded, and given a Fresno float finish.

- The floor is then flooded to promote a long, thorough concrete cure, resulting in a high-quality, watertight DN TANKS floor.



NIGHT FLOOR PLACEMENT

FLOODED FLOOR

PRECAST WALL PANEL BED

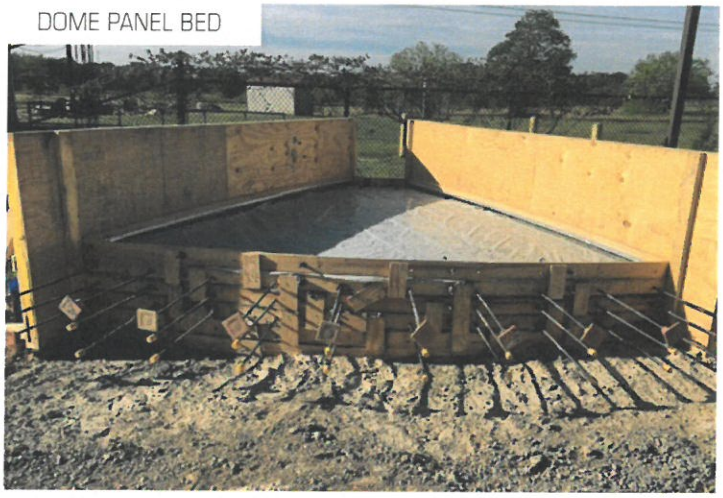
PLACING CONCRETE

# PRECASTING WALL AND DOME PANELS

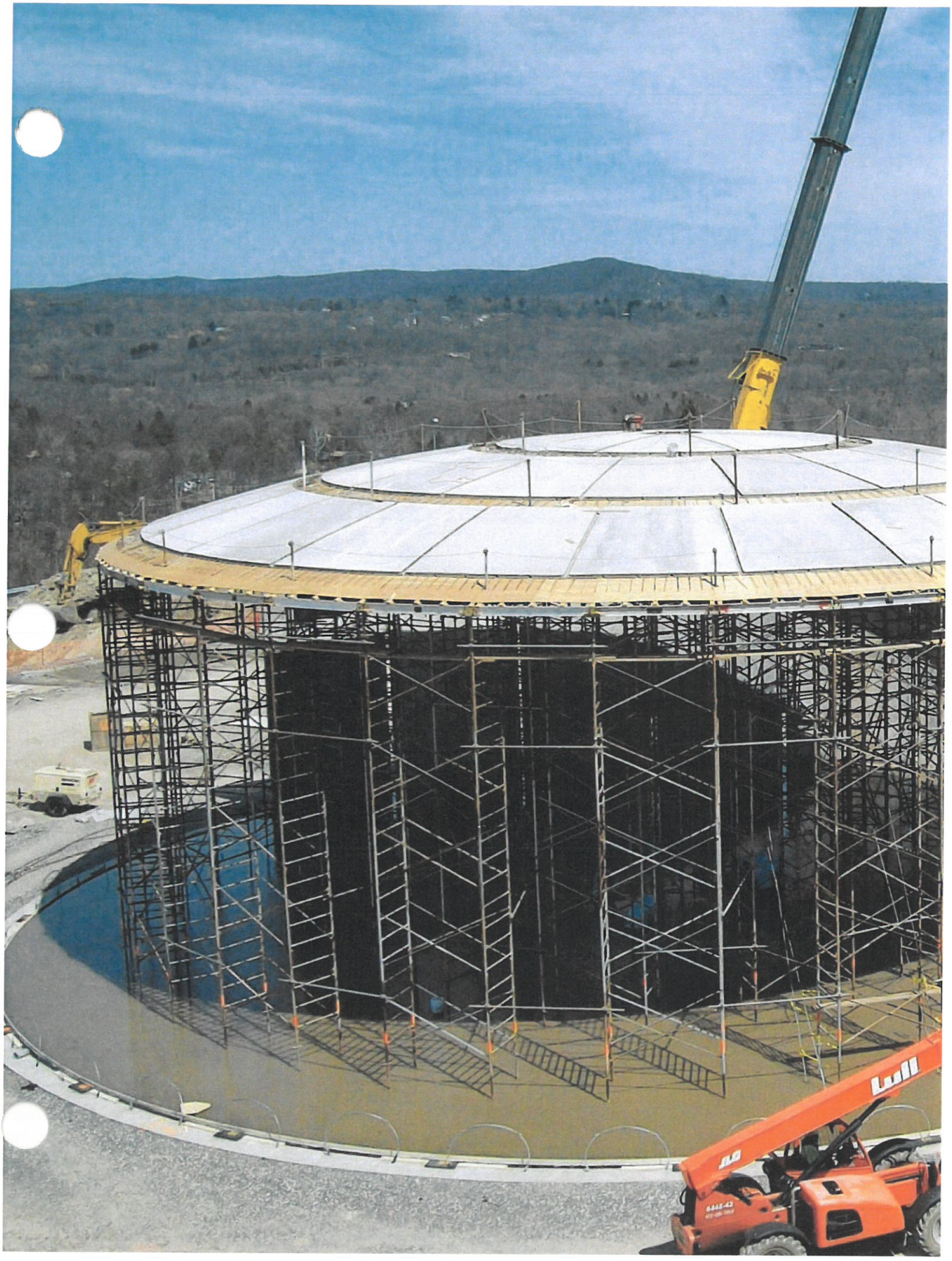
- Wall and dome panels are precast on-site in casting beds that are custom formed to the curvature of each tank.
- An essential feature of AWWA D110 Type III tanks is the use of an embedded steel diaphragm in the tank wall, which acts as a positive water barrier to assure watertightness.
- DN TANKS' standard Type III roof system utilizes a freestanding, spherical, concrete dome with no interior columns.
- The dome is constructed as a series of concentric rows of individual dome panels, curved radially and circumferentially to form a spherical dome.
- When required due to site conditions, DN TANKS can construct a cast-in-place dome.
- When a tank is designed to receive earth cover or to minimize the total finished height, DN TANKS constructs a column-supported flat slab concrete roof.

FINISHING WALL PANEL

DOME PANEL BED



On-site precasting combines in-plant quality with on-site efficiency.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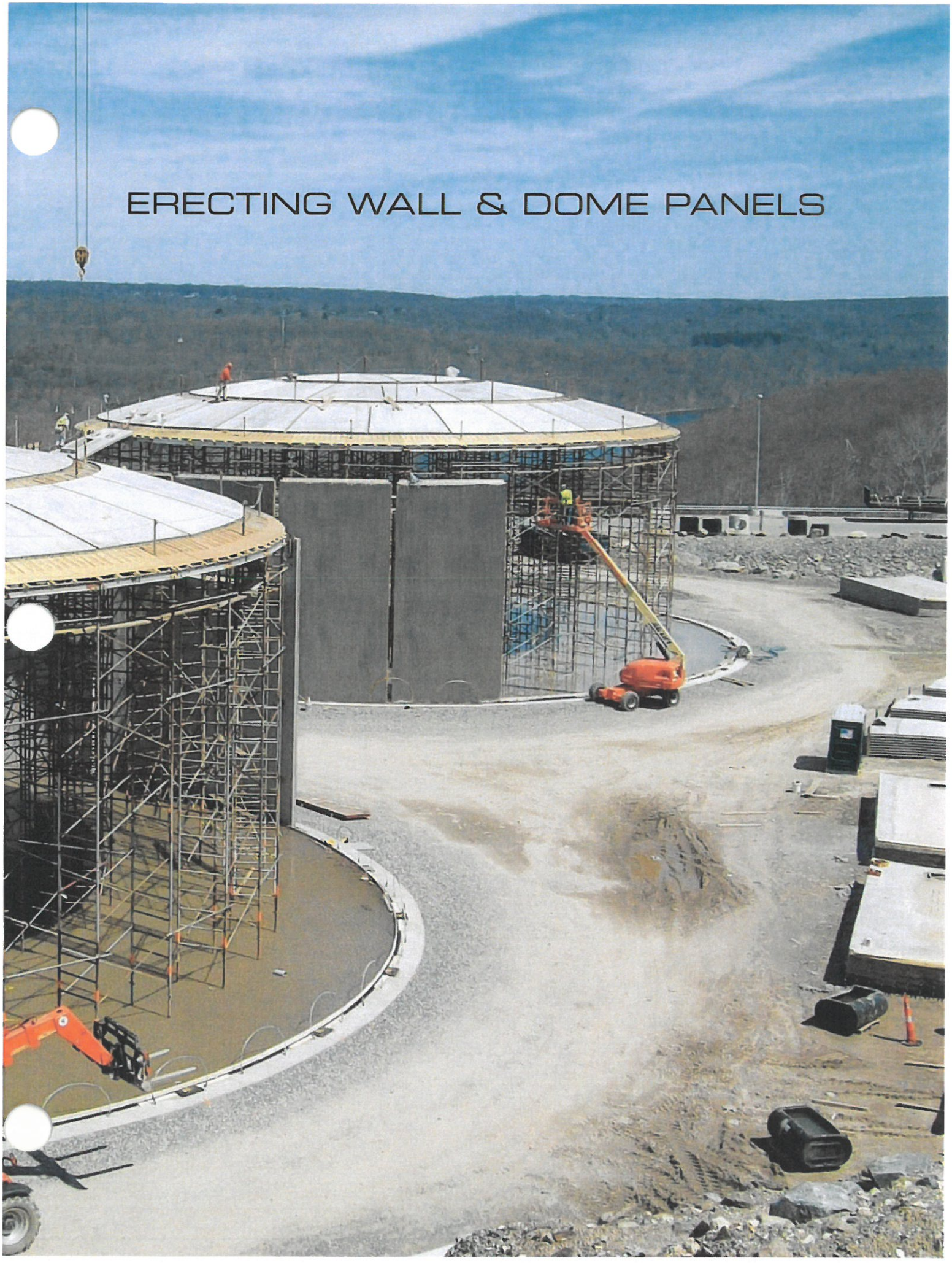
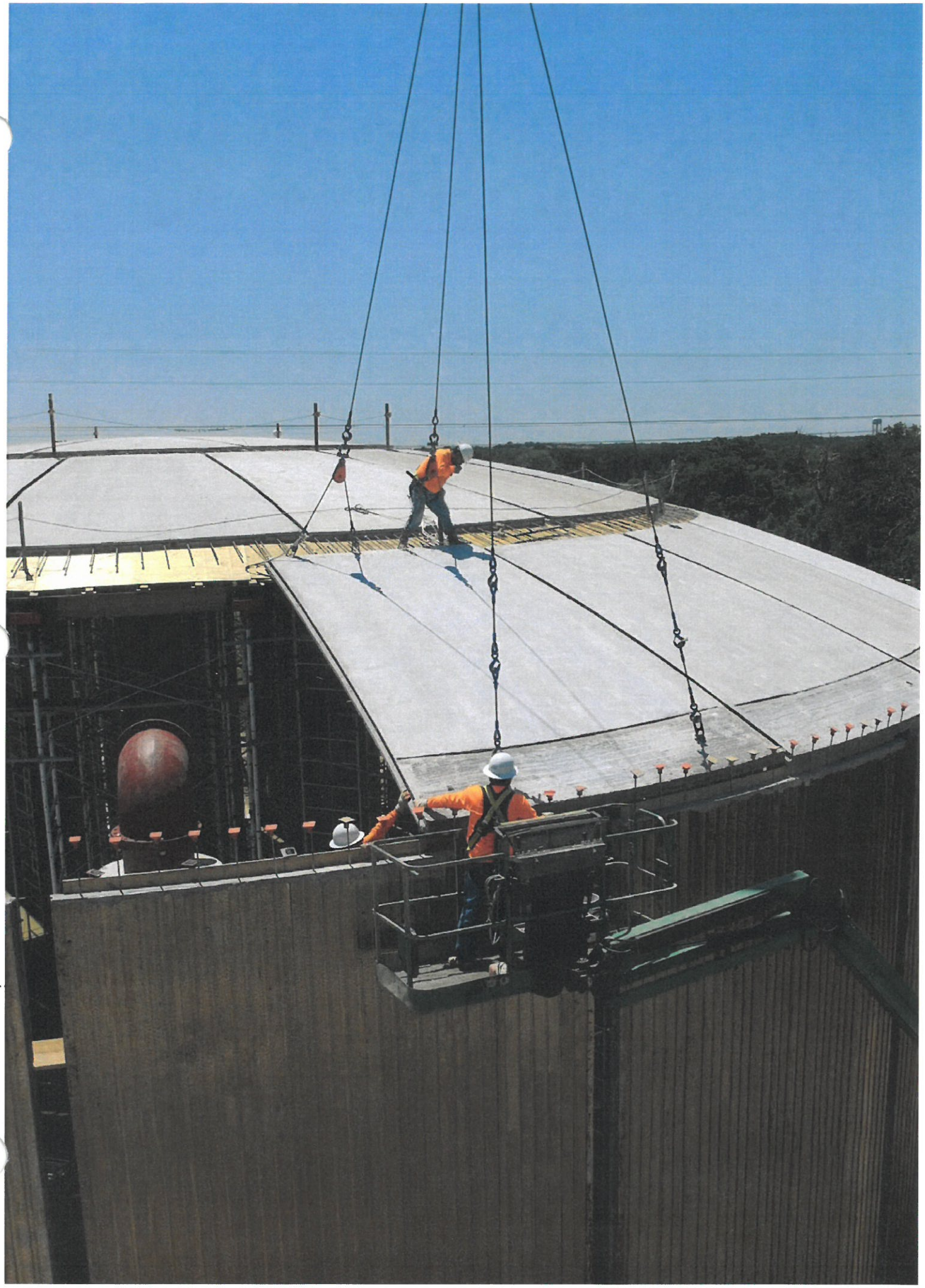
# ERECTING WALL & DOME PANELS



# ERECTING WALL & DOME PANELS

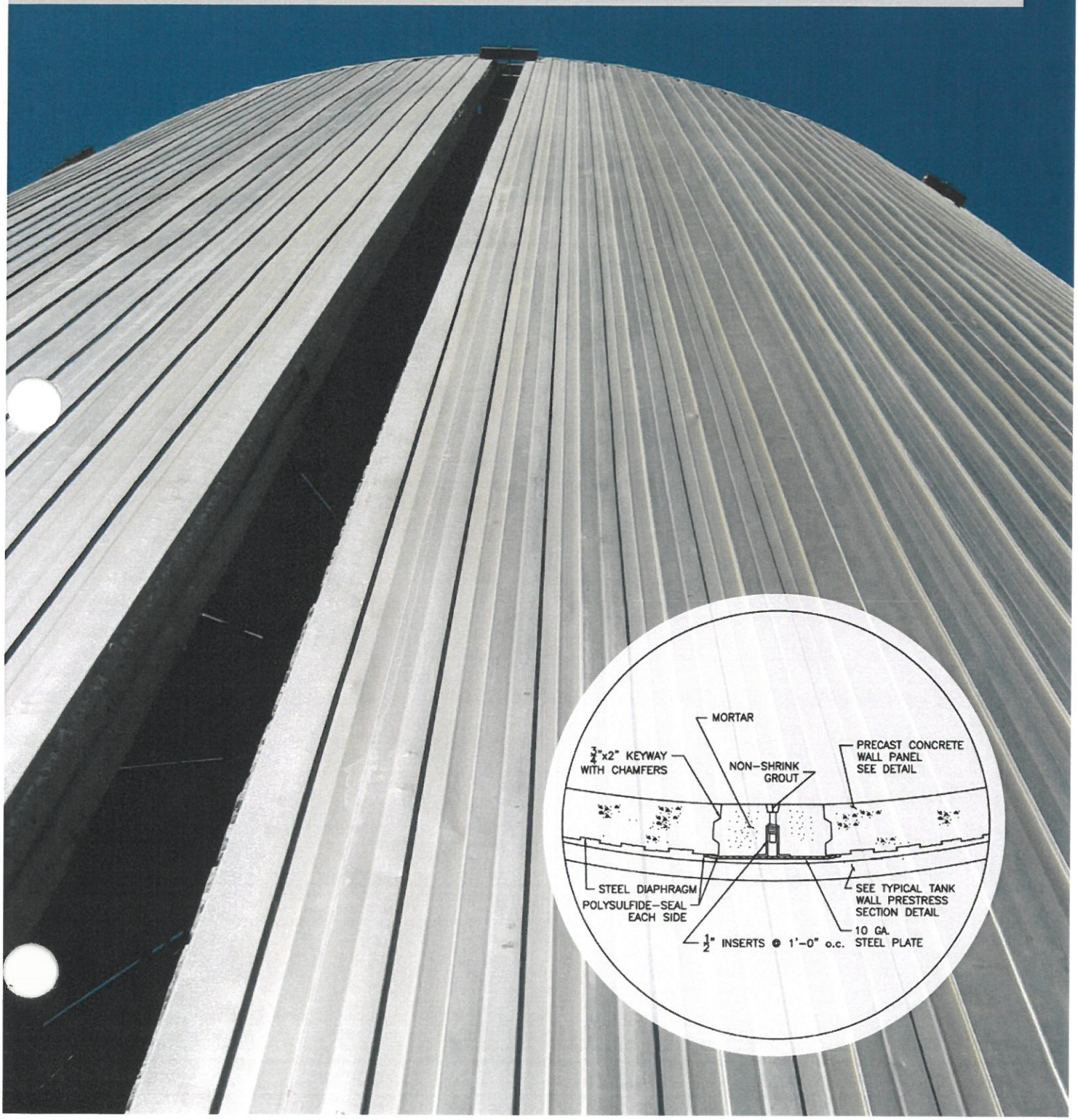
Precast wall and dome panels are inspected, and concrete quality and strength are confirmed prior to erection.

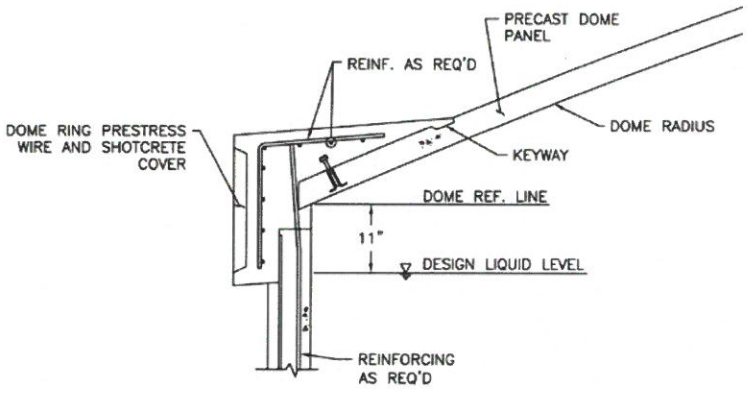
- When the floor achieves its required strength, heavy-duty shoring is erected to temporarily support the precast dome panels.
- The wall panels and dome panels are erected concurrently.
- The wall panels are placed onto bearing pads outside of the encased waterstop. Set approximately 7 to 10 inches apart, the wall panels form a series of open slots, which are later closed.
- Simultaneously, the dome panels are set, spanning between the concentric rows of circumferential forms.
- For tanks requiring a flat slab roof, support columns are constructed and a shoring system is erected. Once the roof slab reinforcing is completed, the roof concrete is placed, finished, and cured in place.



# TANK CLOSURE

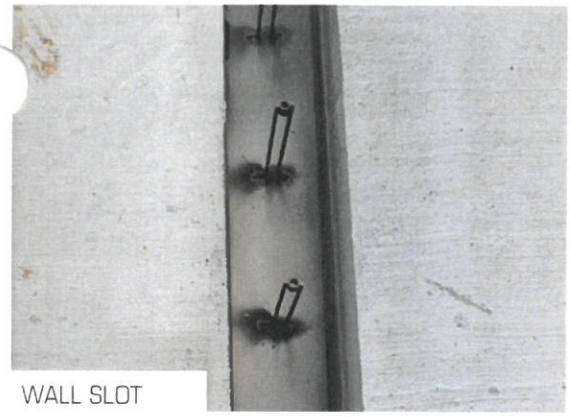
The completed system provides a permanent watertight connection, minimizes vertical bending stresses, and creates resistance to lateral displacement forces.



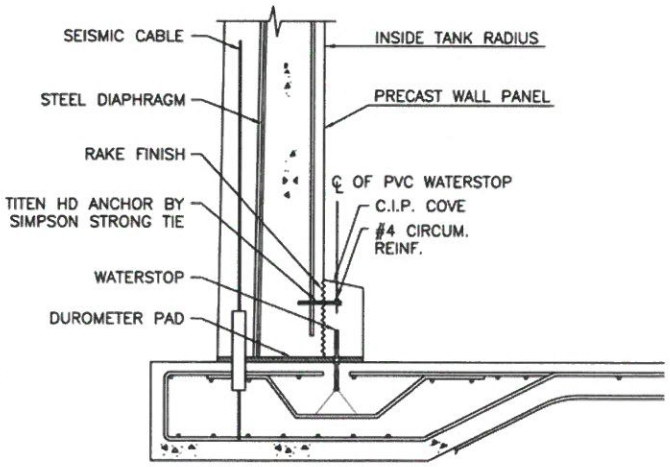



## Wall and Dome Slots Are Permanently Closed

- Heavy-gauge steel plates are erected to span the outside of the wall joint. Temporary forms are erected to span the interior joints, and then high-strength, superplasticized mortar is placed to fill the connection.
- The tank wall is now a continuous cylinder consisting of a high-strength, corrosion-resistant concrete wall on the interior surrounded by a watertight steel shell on the exterior.
- The circumferential and radial joints in the dome are reinforced and filled with concrete, producing a uniform spherical shell.



WALL SLOT



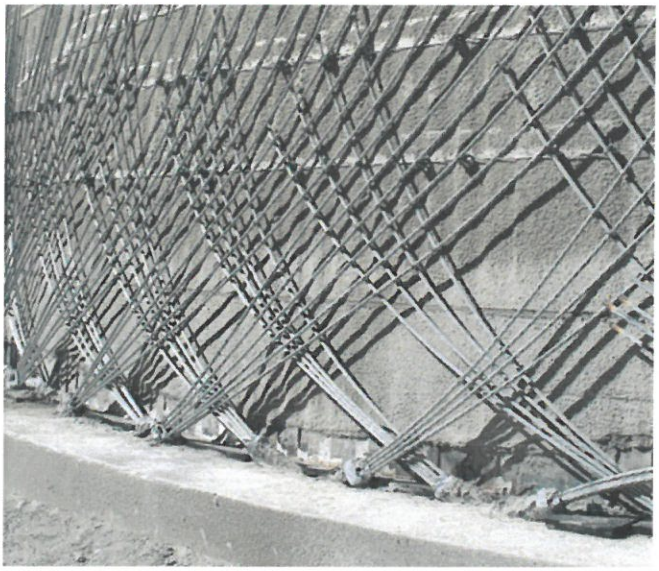

## Floor/Wall and Wall/Dome Connections Are Completed

- The flexible floor/wall connection is designed specifically to minimize vertical bending stresses in the tank wall.
- The waterstop is encased with concrete placed on rubber pads to maintain separation from the floor. The concrete bonds to the rake finish at the bottom of the wall panel.
- A dome ring is formed, reinforced, and cast, providing structural continuity between the tank wall and dome roof.

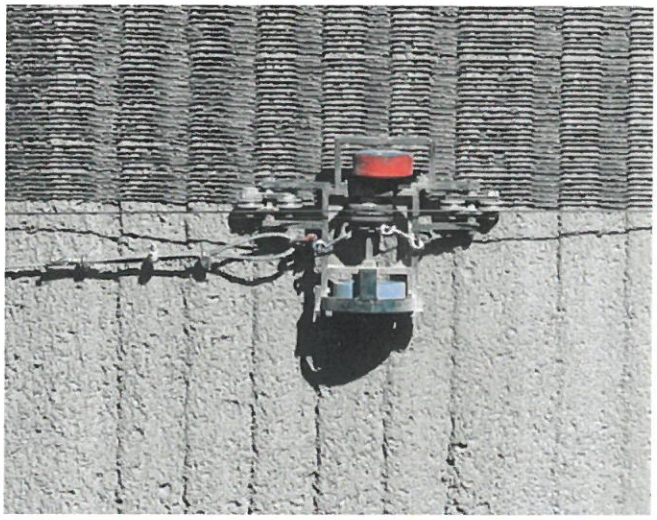
# PRESTRESSING THE TANK

DN TANKS' standard Type III prestressing system utilized the proven wire-winding method. Multiple layers of high-strength, bright steel prestress wire are applied to gradually place the wall and dome into permanent compression.

The redundancy of the multi-layered prestressing provides greater safety for the structure. The number of wire layers and wire spacing are determined by the design requirements. The total prestressing requirements are determined for each tank to provide initial and residual compression.



► Minimum clear wire spacing of 5/16-inch assures individual encasement of each wire providing corrosion protection and bonding.



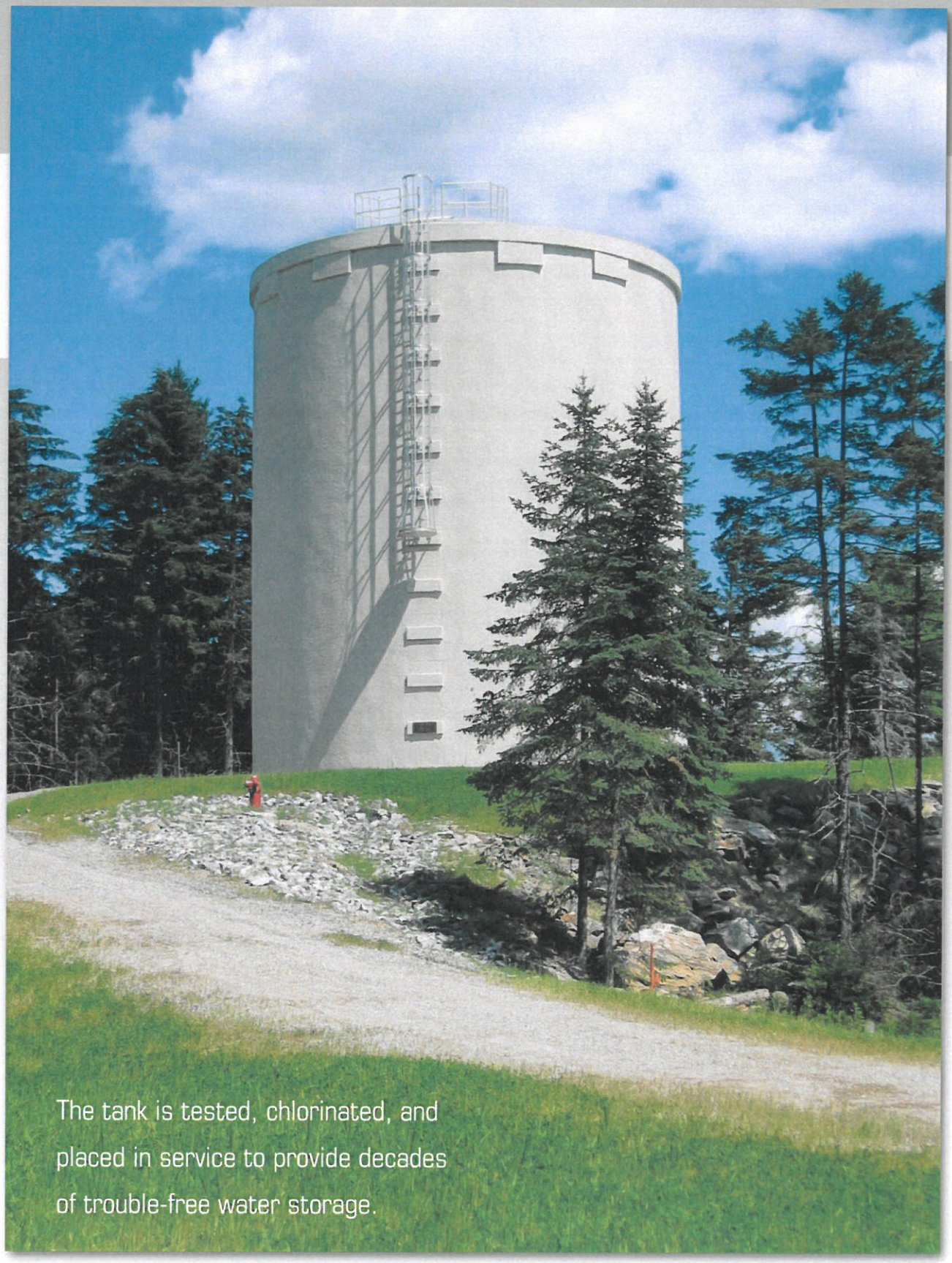
- An initial layer of shotcrete is applied to the wall, encasing the steel diaphragm and base-restraint cables. The high-pH shotcrete passivates the steel, providing permanent corrosion protection.

- A wire spacing device precisely places the wire on the tank wall.
- Reels of wire are spliced together to create continuous prestressing from top to bottom.
- The wire force is measured in place to verify it is within specified tolerances.
- Prestressing for the dome is applied to the vertical face of the dome ring, placing the dome into compression. This results in a freestanding, clear span dome roof.
- Each layer of wire is individually encased and permanently bonded in shotcrete.

After the wire-winding process is completed, a final protective shotcrete covercoat is applied.

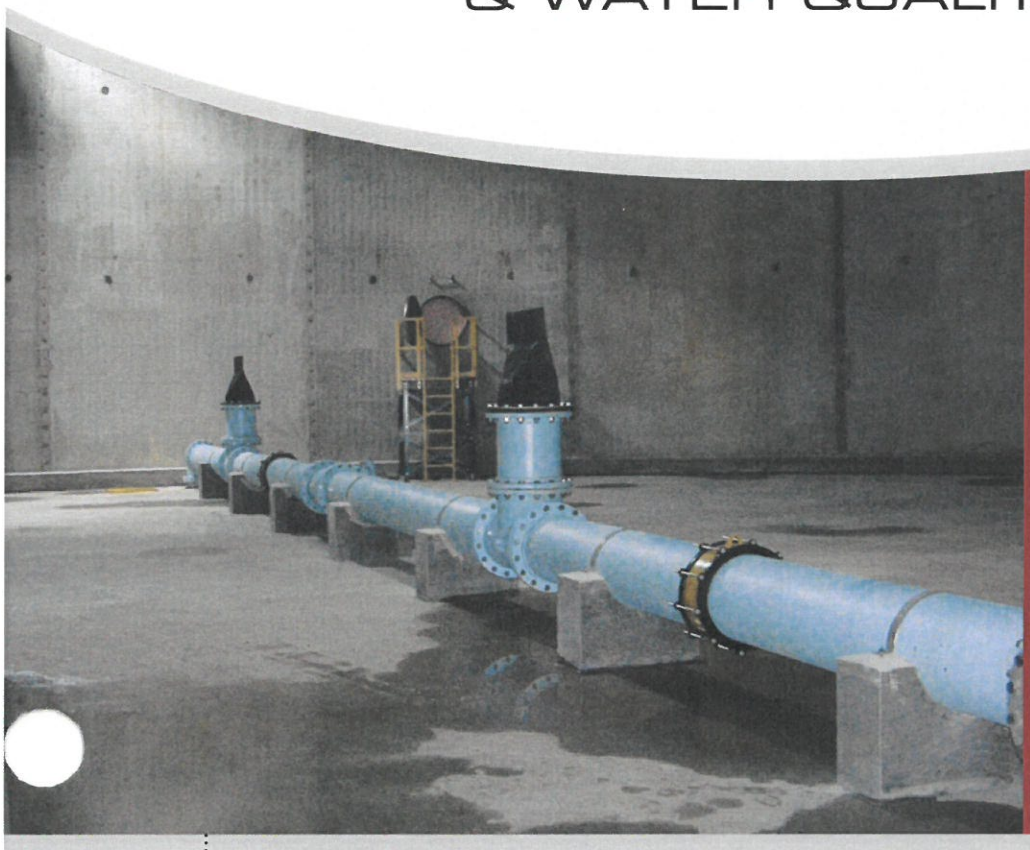
- Temporary vertical guide wires are placed two feet on center on the tank wall.
- An experienced DN TANKS nozzle-man then applies the shotcrete cover coat.
- The finished tank exterior receives an architectural concrete coating, providing a uniform tank appearance.

# COMPLETING THE TANK

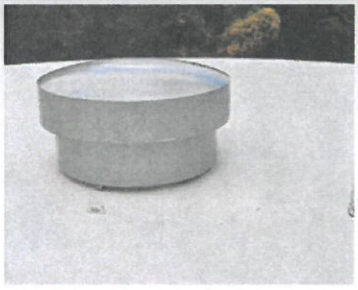


The tank is tested, chlorinated, and placed in service to provide decades of trouble-free water storage.

# INTERIOR PIPING, ACCESSORIES & WATER QUALITY



► In response to specific water quality design requirements, various mixing systems are available, ranging from separated piping, to flow-based systems, to mechanical mixing equipment.



- Accessories, such as roof and wall access hatches, interior and exterior ladders, vents, safety railings, level sensing equipment, or specialized security hardware, are available to meet specific project requirements.
- Baffle wall systems are available to meet C/T design requirements for finished water storage.

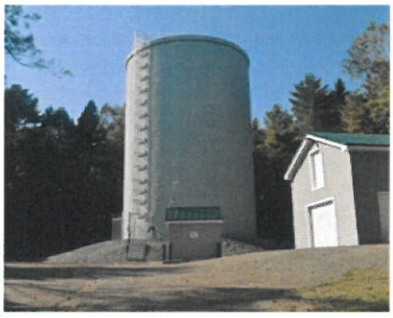
# DN TANKS GALLERY

A few of the many faces of DN TANKS dependability.

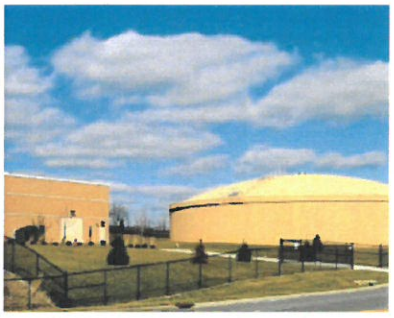
ORLANDO, FLORIDA

FREDERICKSBURG, TEXAS

BRIDGEWATER, NEW YORK



BUCKSPORT, MAINE



CINCINNATI, OHIO

COLLINSVILLE, OKLAHOMA

DALLAS, TEXAS

BRANSON, MISSOURI

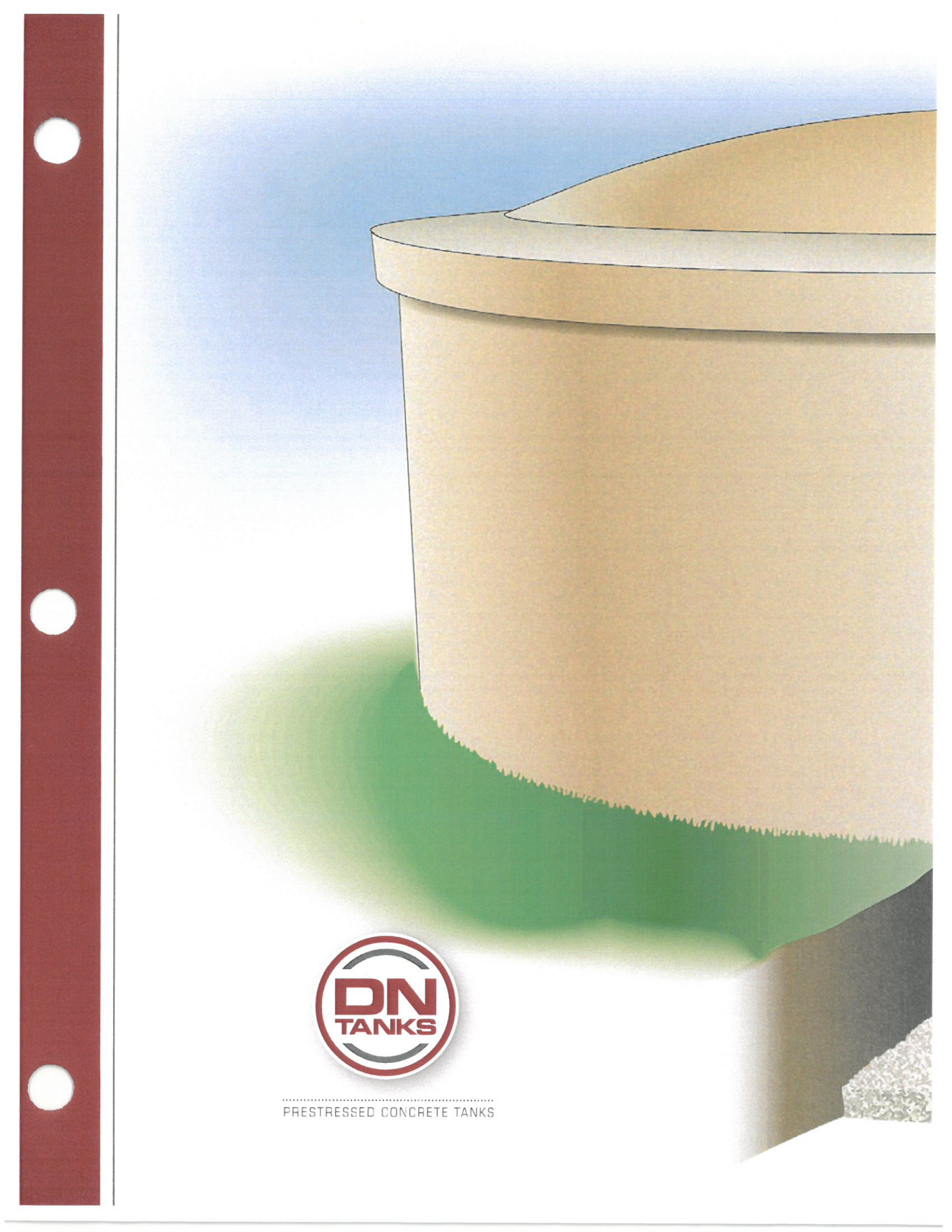
GREEN BAY, WISCONSIN

MT. HOPE, WEST VIRGINIA

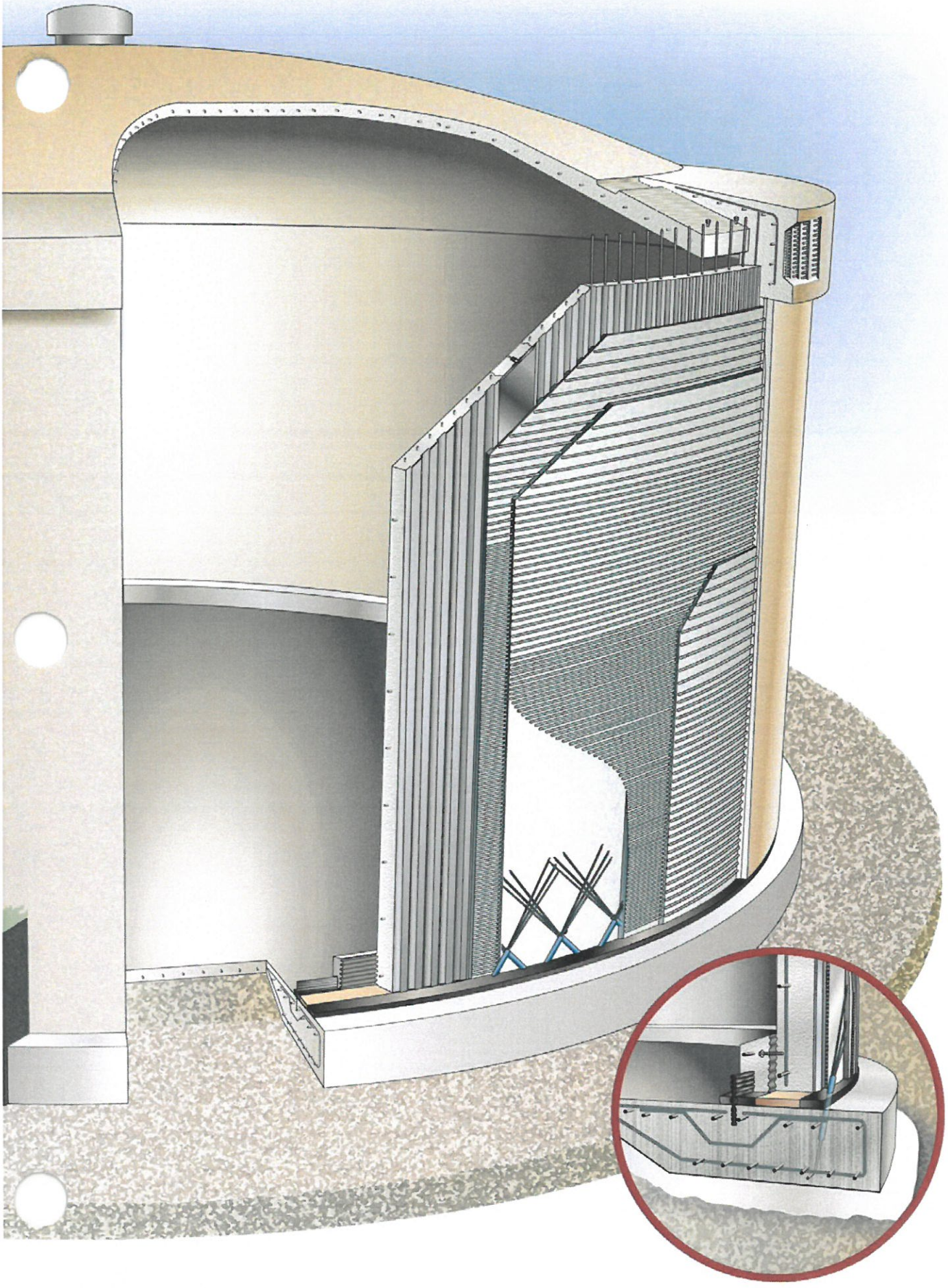
NEW BETHLEHEM, PENNSYLVANIA

WESTMINSTER, COLORADO

■ To view more completed tanks visit: www.dntanks.com




PRESTRESSED CONCRETE TANKS




**Generations Strong**

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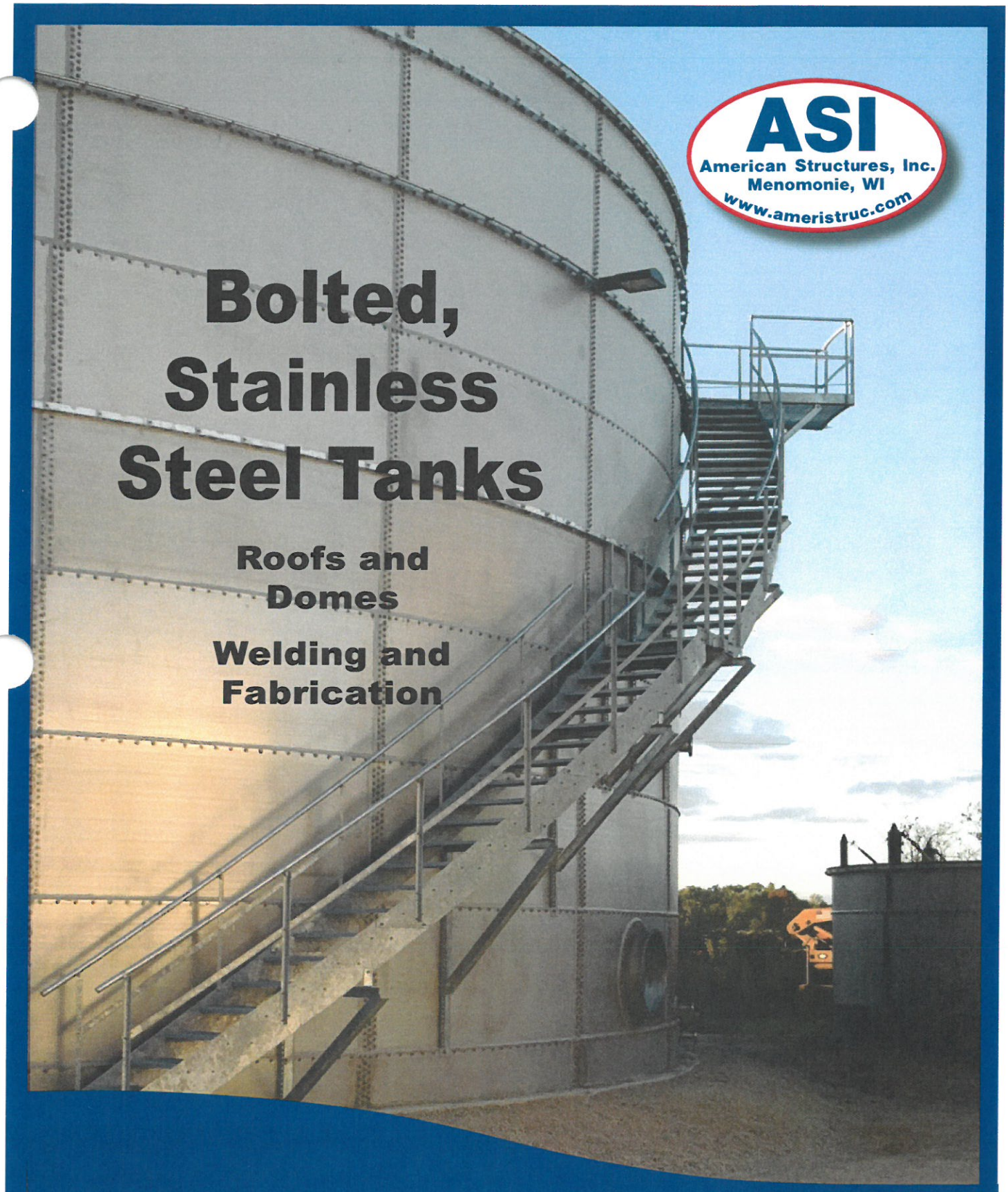


**American Structures, Inc.**
P.O. Box 409 • Menomonie, WI
715-235-4225 • Fax: 715-235-6212
www.ameristruc.com

## Menomonie, WI Location

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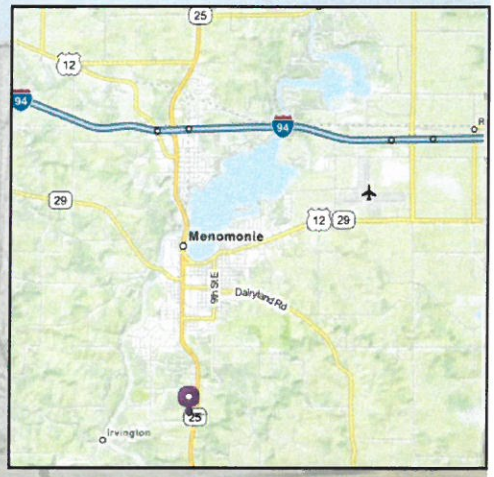
54751

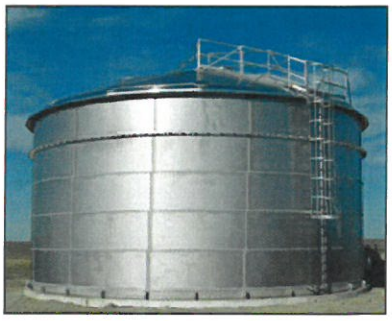

**DIRECTIONS:**
From Interstate-94 in Wisconsin, take Exit 41, Highway 25. Turn left onto Hwy 25 South, through Menomonie. Approximately 2 miles south of Menomonie, turn West or right on County Road D, take an immediate right onto 469th Street. Follow road to our company parking area.




## Bolted Stainless Steel Tanks are Versatile

Bolted stainless steel storage tanks have been around for many years and are fast becoming the most viable solution to storage needs. Welded stainless tanks have been around for many, many years, primarily in the milk and food processing industry.

The bolted stainless tank is generally made of 304, 304L, 316, or 316L stainless, and in some applications 317 or duplex stainless is used. These tanks meet the ASTM, AWWA, as applicable, and API specifications as necessary.



Bolted stainless tanks are environmentally neutral as they are not shiny but a dull grey, which is very attractive in most settings. The stainless material comes in plates and sheets which may differ a little in color at first but within a couple of months the unpolished stainless passivates and becomes a dull grey.

Bolted, stainless steel tanks may cost a little more than the painted mild steel or factory-coated tanks, but have a very positive impact on the environment through the area of expandability and are nearly maintenance free (no need for sandblasting, painting, cleanup or concerns about contamination due to surface failures). Most bolted stainless tanks are designed to expand their size for a nominal fee by adding plates to the bottom and making the unit taller. Another area, and probably the most important to everyone, is the residual value, if the tank is no longer needed. Unlike the factory-coated, field-coated or concrete tanks, stainless has a high residual value in the recycling chain because it does not lose value and requires little, if any, intervention from federal or local agencies for cleanup.

Bolted stainless tanks are very easy to relocate or ship new via common carrier because they are shipped on pallets with hardware boxed separately. The tanks are accepted universally and are growing in popularity. They are very popular in water treatment from pre-treatment to potable water storage. These water tanks can be used in conjunction with composite water towers, reservoirs, standpipes or pretreatment tanks. They are also used in stormwater storage and management and waste treatment plants. Bolted stainless tanks are becoming very popular in the groundwater cleanup area, from collecting leachate from landfills to industrial site groundwater remediations.

They are used extensively in wastewater plants because of their durability in storage, processing and clarifying of the harsh products and vary in size from very small to very large. Examples of types of tanks are sludge storage, clarifiers, waste treatment, digester tanks, bio towers (trickling filter tanks) and more. They are and have been used for odour control, air pollution control and for their environmental appearances. These tanks have also been designed and used for methane generators.


Environmental Science & Engineering - www.esemag.com - May 2005

# Advantages of Bolted, Stainless Steel Tanks

Bolted stainless steel tanks have many unique qualities that make them an efficient and pragmatic choice for liquid and dry storage solutions.

- Bolted, stainless steel tanks provide lasting service without common corrosion problems, as the unique metallurgical properties of the metal provides a surface that heals itself.
- American Structures, Inc. commonly uses 304 and 316 austenitic stainless steel grades.
- 316 stainless steel has greater corrosion resistance in chloride-containing media and is usually preferred for long term service in aggressive industrial, chemical and seacoast atmospheres.
- Stainless steel is NSF approved
- Bolted, stainless steel tanks are cost effective to expand or move.
- Bolted, stainless steel tanks are 100% recyclable should the need for the tank no longer exist.
- Bolted, stainless steel tanks are virtually maintenance free. We have tanks in the field for 20 plus years with no maintenance work done on them.

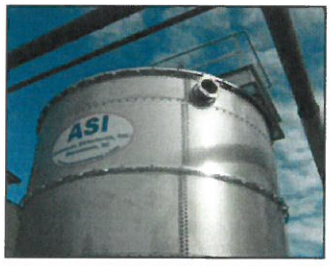
## American Structures, Inc.
## Bolted Stainless Steel Tank Standard Materials

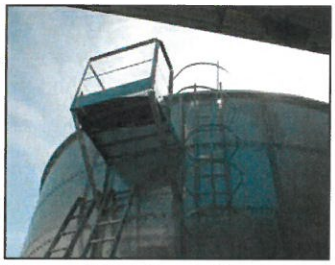
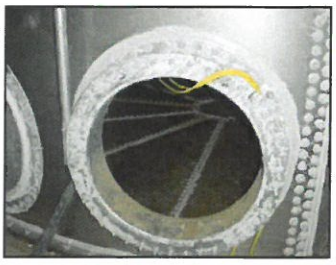
***Our foundations, tanks and appurtenances meet or exceed most Water Storage Tank Standards.***

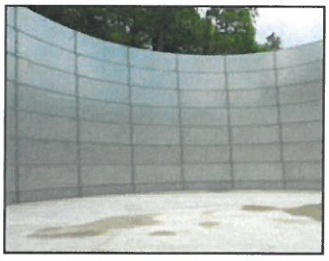
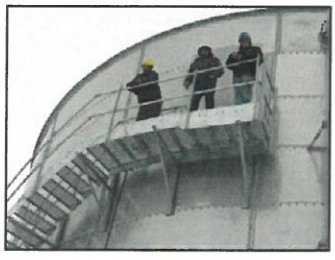
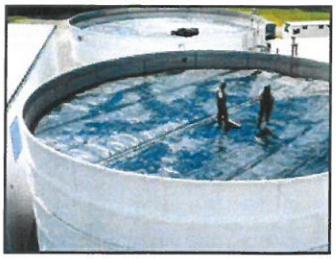
- **Foundation:** Concrete footing and foundation with 4,000 psi mix and 60 ksi re-bar as to ACI Standards.
- **Tank Floor:** 4,000 psi mix and 60 ksi re-bar concrete floor ***or*** bolted, stainless steel floor of 304 stainless steel

***Tank Materials***

- **Side Sheets:** Potable water tanks are typically 304, 316, or 201 stainless steel sheet steel
  All sheet and plate thicknesses meet or exceed most standards for tank design
  All sheet thicknesses are determined by tank size, location and specifications as per design needs
- **Nuts, Bolts & Washers:** Stainless steel
- **Nozzles & Manways:** 150# flanged nozzles of stainless steel or hot dipped galvanized steel
- **Ladder, Cage, Lock Out and Step Off Platform:** Hot dipped galvanized steel and designed to meet OSHA safety standards
- **Stainless Steel Roofs, Vents and Hatches:** 304 ,316, or 201 stainless steel
- **Option:** Aluminum geodesic dome
- **Web Trusses:** Hot dipped galvanized steel
- **Tank & Appurtenances:** American Structures, Inc. tanks are designed and built to meet the specific needs of each customer's storage needs

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# Reservoir Water Tanks

## Potable Water Storage Tanks

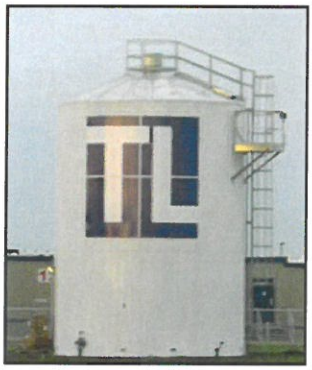
- Reservoirs
- Standpipes
- Clearwells
- Insulated Reservoir Tanks

These are examples of tanks that provide portable water storage options for a variety of containment applications in which the water stored can be consumed by humans, without concern for adverse health effects.

**Where:** Tioga, ND
**Type of Tank**: Insulated Reservoir Water Tank
**Size:** 18.46' x 25'
**Capacity:** 50,100 Gallons
**Customer:** Tradesmen Construction
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

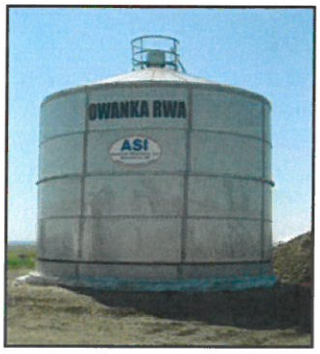

**Where:** Dickinson, ND
**Type of Tank:** Insulated Reservoir Water Tank
**Size:** 18.46' x 25'
**Capacity:** 50,101 Gallons
**Customer:** Target
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Watford, ND
**Type of Tank:** Insulated Reservoir Water Tank
**Size:** 24.62' x 28.83'
**Capacity:** 68,150 Gallons
**Customer:** City of Watford, ND
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



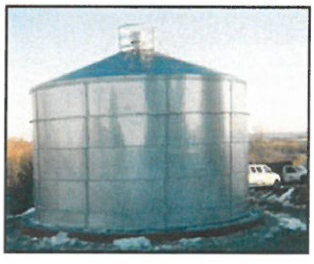
**Where:** Tioga, ND
**Type of Tank:** Insulated Reservoir Water Tank
**Size:** 18.46' x 25'
**Capacity:** 50,100 Gallons
**Customer:** Tradesmen Construction
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Mansfield, PA
**Type of Tank**: Reservoir Water Tank
**Size:** 67.69' x 37'
**Capacity:** 1,000,000 Gallons
**Customer:** University of PA-Mansfield
**Type of Floor:** Concrete Floor
**Type of Roof:** Aluminum Geodesic Done




**Where:** Owanka, SD
**Type of Tank:** Reservoir Water Tank
**Size:** 24.63' x 28.83'
**Capacity:** 103,309 Gallons
**Customer:** City of Owanka, SD
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Cassville, MO
**Type of Tank:** Reservoir Water Tank
**Size:** 55.93' x 28.83'
**Capacity:** 519,597 Gallons
**Customer:** George's Foods
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome



**Where:** Spalding, NE
**Type of Tank**: Reservoir Water Tank
**Size:** 30.77' x 17'
**Capacity:** 96,470 Gallons
**Customer:** City of Spalding, NE
**Type of Floor**: Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

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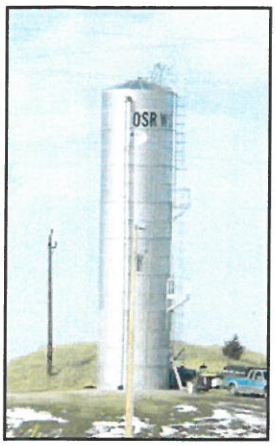
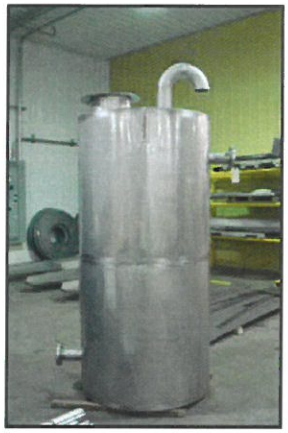
# Reservoir Water Tanks

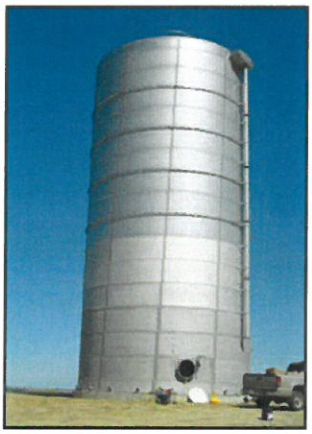


**Where:** Fairfield, ND
**Type of Tank:** Reservoir Water Tank
**Size:** 43.07' x 21.17'
**Capacity:** 60,000 Gallons
**Customer:** ESCO
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Aluminum Geodesic Dome

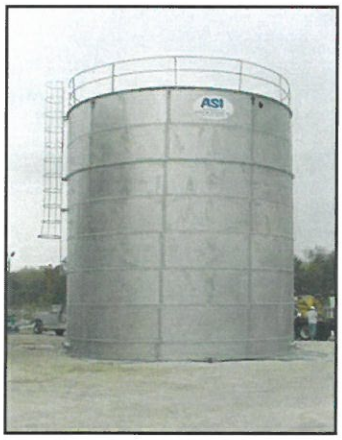
**Where:** Hyden, KY
**Type of Tank:** Reservoir Water Tank
**Size:** 12.31' x 51.83'
**Capacity:** 46,137 Gallons
**Customer:** Hyden-Leslie County Water District
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



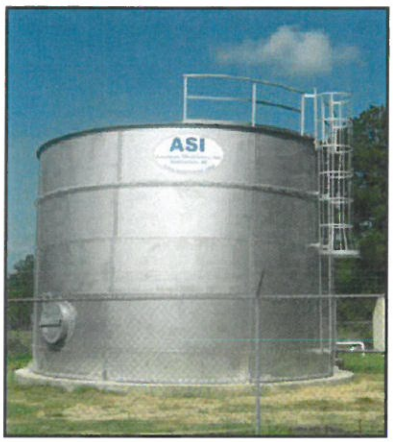
**Where:** Prior Lake, MN
**Type of Tank:** (2) Reservoir Water Tanks
**Size:** 3'6" x 7'
**Capacity:** 500 Gallons
**Customer:** SMSC Water Reclamation
**Type of Floor:** Welded, Stainless Steel
**Type of Roof:** Welded, Stainless Steel



**Where:** Keever Buttes, ND
**Type of Tank:** Reservoir Water Tank
**Size:** 30.77' x 61.4'
**Capacity:** 331,000 Gallons
**Customer:** SCRWD Standpipe
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



**Where:** Columbus Junction, IA
**Type of Tank:** Reservoir Water Tank
**Size:** 27.69' x 28.83'
**Capacity:** 129,577 Gallons
**Customer:** Tyson Foods
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

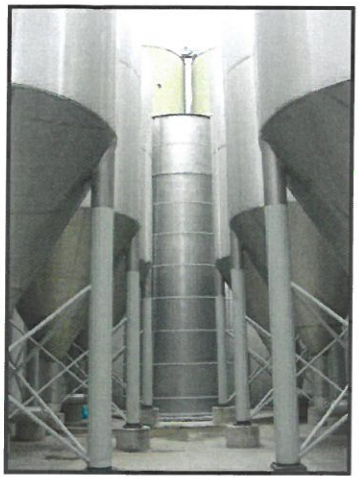


**Where:** Village Mills, TX
**Type of Tank:** Reservoir Water Tank
**Size:** 24.62' x 17.33'
**Capacity:** 62,100 Gallons
**Customer:** Wildwood Property Owners
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

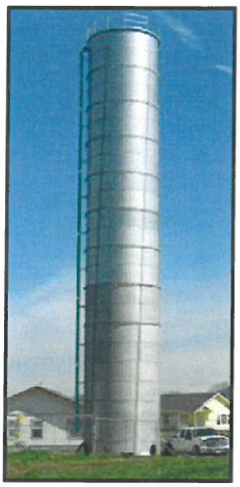
**Where:** San Marcos, CA
**Type of Tank:** Reservoir Water Tank
**Size:** 33.85' x 17.33'
**Capacity:** 116,000 Gallons
**Customer:** Hollandia Dairy
**Type of Floor:** Bolted, Stainless Steel Floor
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Wanblee, SD
**Type of Tank:** Reservoir Water Tank
**Size:** 15.38' x 60'
**Capacity:** 87,200 Gallons
**Customer:** Oglala Sioux Nation
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

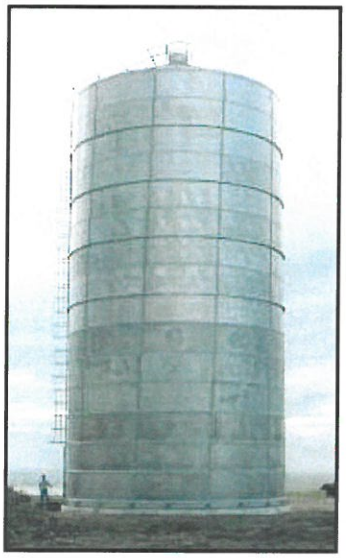
# Reservoir Water Tanks



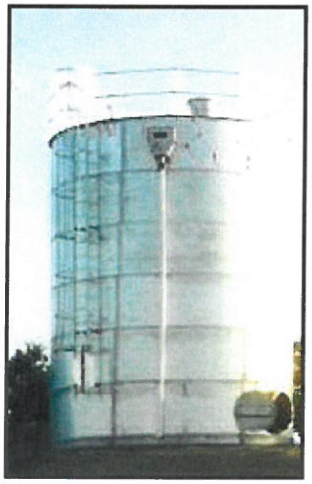
**Where:** Fort Collins, CO
**Type of Tank:** Reservoir Water Tank
**Size:** 15.38' x 36.6'
**Capacity:** 51,000 Gallons
**Customer:** New Belgium Brewery
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel



**Where:** Everson, WA
**Type of Tank:** Reservoir Water Tank
**Size:** 15.38' x 90'
**Capacity:** 125,400 Gallons
**Customer:** Nooksack Indian Housing
**Type of Floor:** Concrete

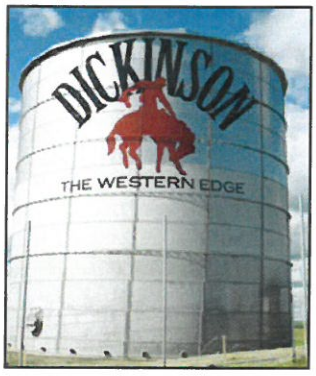


**Where:** Wakpala, SD
**Type of Tank:** Reservoir Water Tank
**Size:** 30.77' x 58.5'
**Capacity:** 330,939 Gallons
**Customer:** Standing Rock Reservation
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



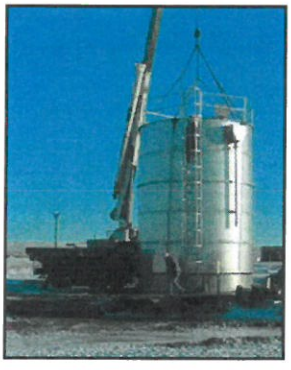
**Where:** Almont, ND
**Type of Tank:** Reservoir Water Tank
**Size:** 18.46' x 23.5'
**Capacity:** 47.047 Gallons
**Customer:** City of Almont, ND
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

**Where:** Galesville, WI
**Type of Tank:** Reservoir Water Tank
**Size:** 37.8' x 5'
**Capacity:** Gallons
**Customer:** Rolling Dice
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome




**Where:** Dickinson, ND
**Type of Tank:** Reservoir Water Tank
**Size:** 46.17' x 44'
**Capacity:** 525,000 Gallons
**Customer:** City of Dickinson, ND
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Aluminum Geodesic Dome

**Where:** Bakersfield, CA
**Type of Tank:** Reservoir Water Tank
**Size:** 21.54' x 28.83' and 24.62' x 32.66'
**Capacity:** 78,590 and 117,033 Gallons
**Customer:** Borba Farm
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel



**Where:** Rapid City, SD
**Type of Tank:** Reservoir Water Tank
**Size:** 15.38' x 32.8'
**Capacity:** 45,634 Gallons
**Customer:** Rolling Dice
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

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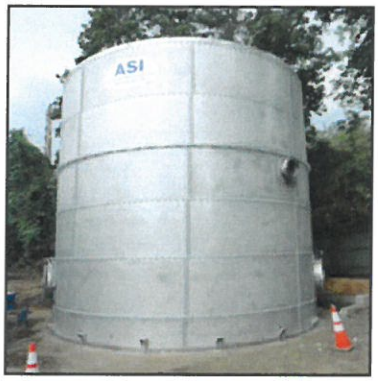
# Aeration Tanks

## Non-Potable Water Storage Tanks

These tanks are examples of tanks that provide storage options for the containment, storage, and processing of waste water, re-use, run-of water, which are not meant for human consumption.

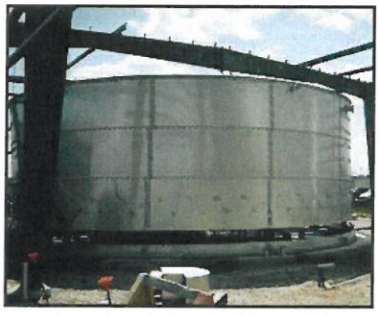
- Aeration Tanks
- Clarifier Tanks
- Digester Tanks
- Equalization Tanks
- Filter Tanks
- Leachate Storage Tanks
- Sludge Storage Tanks
- Waste Water Tanks

**Where:** Wayland, MA
**Type of Tank:** Aeration Tank
**Size:** 12.31' x 13'
**Capacity:** 10,683 Gallons
**Customer:** Bio-Process H20
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Stell



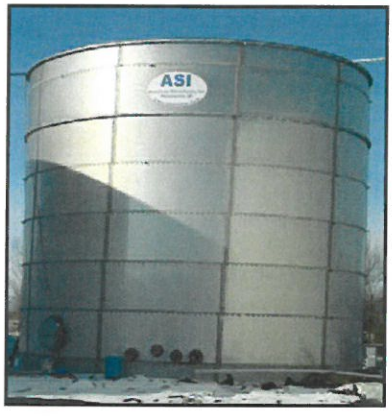

**Where:** Collingswood, NJ
**Type of Tank:** Aeration Tank
**Size:** 24.62' x 21.17'
**Capacity:** 75,323 Gallons
**Customer:** Collingswood WWTP
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Slidell, LA
**Type of Tank:** Aeration Tank
**Size:** 36.92' x 17.33'
**Capacity:** 312,335 Gallons
**Customer:** Huntwyck WWTP
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Dundee, MI
**Type of Tank:** Aeration Tank
**Size:** 36.92' x 20
**Capacity:** 169,581 Gallons
**Customer:** Chysler
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel

**Where:** Fletcher, NC
**Type of Tank:** Aeration Tank
**Size:** 40' x 17.33'
**Capacity:** 162,920 Gallons
**Customer:** Sierra Nevada Brewing
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome




**Where:** Litchfield, MN
**Type of Tank:** Aeration Tank
**Size:** 30.77' x 27'
**Capacity:** 150,174 Gallons
**Customer:** Sparboe Egg Farms
**Type of Floor:** Concrete
**Type of Roof:** Open Top


**Where:** Grand Forks, ND
**Type of Tank:** Aeration Tank
**Size:** 53.3' x 19.5'
**Capacity:** 278,580 Gallons
**Customer:** J.R. Simplot
**Type of Floor:** Concrete
**Type of Roof:** Open Top

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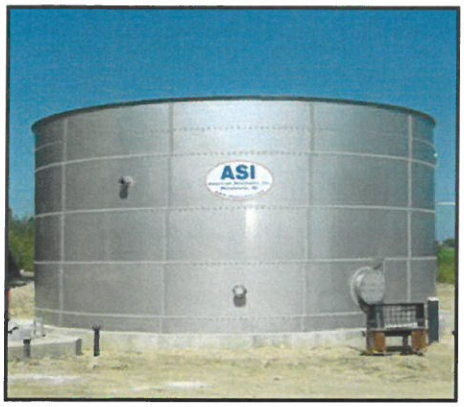
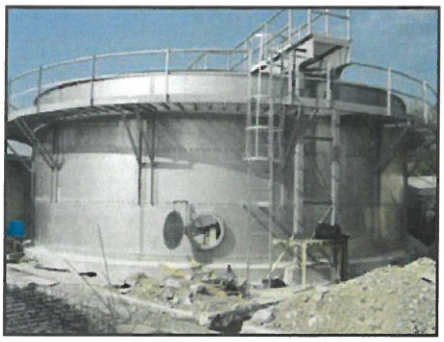
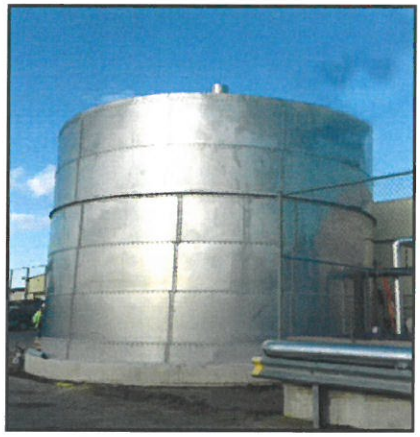
# Clarifier & Digester Tanks




**Where:** Brownsville, WI
**Type of Tank:** Clarifier
**Size:** 35.3' x 17.33'
**Capacity:** 126,864 Gallons
**Customer:** Grande Cheese
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Saltillo, MX
**Type of Tank:** Clarifier
**Size:** 36.92' x 13.5'
**Capacity:** 108,108 Gallons
**Customer:** Pepsico
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Beloit, WI
**Type of Tank:** Clarifier
**Size:** 33.85' x 21.17
**Capacity:** 142,496 Gallons
**Customer:** Frito-Lay
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Lawrenceville, IL
**Type of Tank:** Clarifier
**Size:** (2)-49.23' x 16.6'
**Capacity:** Both, 246,785 Gallons
**Customer:** Lawrenceville, IL WWTP
**Type of Floor:** Both, Concrete
**Type of Roof:** Both, Open Top

**Where:** Chenango, NY
**Type of Tank:** Aerobic Digester Tank
**Size:** 30.77' x 20.66'
**Capacity:** 114,913 Gallons
**Customer:** City of Chenango, NY
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Delhi, NY
**Type of Tank:** Anaerobic Digester Tank
**Size:** 49.23' x 14.87'
**Capacity:** 213,570 Gallons
**Customer:** Morningstar Foods/ Dean Foods
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch Bolted, Stainless Steel

**Where:** Slidell, LA
**Type of Tank:** Clarifier
**Size:** 55.39' x 17.33'
**Capacity:** 138,821 Gallons

**Customer:** Huntwyck WWTP
**Type of Floor:** Concrete
**Type of Roof:** Open Top


**Where:** Luxemburg, WI
**Type of Tank:** Aerobic Digester
**Size:** 33.57' x 28.33'

**Capacity:** 190,689 Gallons
**Customer:** Agropur, Inc.
**Type of Floor:** Concrete
**Type of Roof:** Open Top

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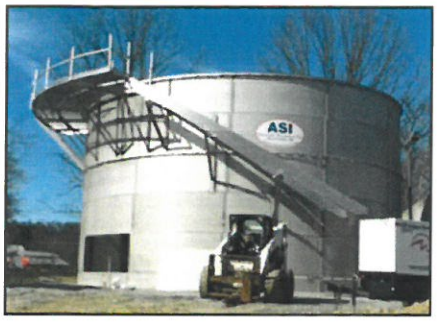
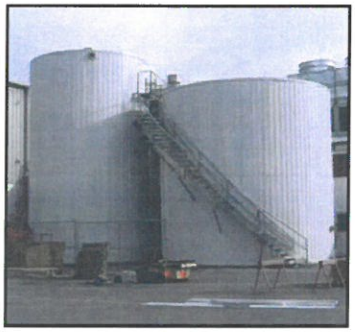
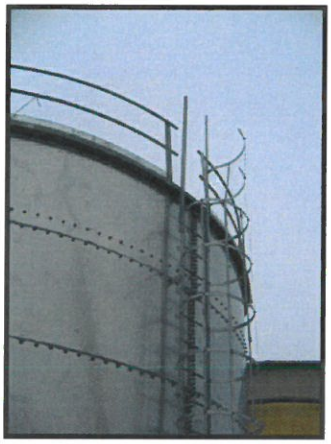
# Digester Tanks



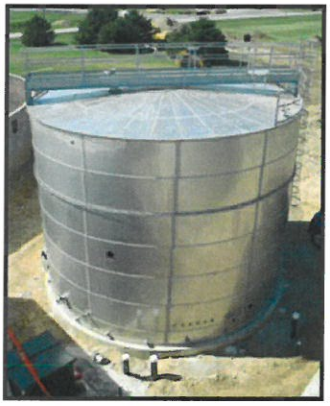

**Where:** Bloomfield, PA
**Type of Tank:** Anaerobic Digester
**Size:** 40' x 21.17'
**Capacity:** 199,020 Gallons
**Customer:** Bloomfield Borough
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Open Top



**Where:** Northampton, MA
**Type of Tank:** Insulated Anaerobic Digester Tank
**Size:** 24.62' x 25'
**Capacity:** 89,575 Gallons
**Customer:** CCNA
**Type of Floor:** Concrete
**Type of Roof:** Open Top



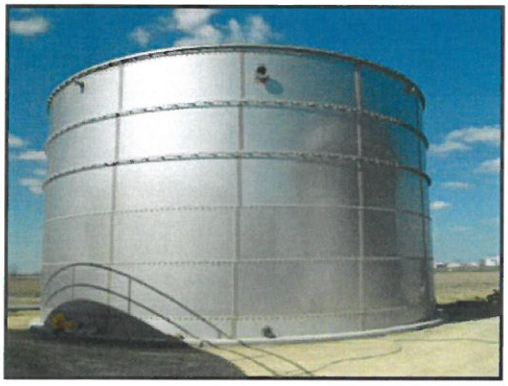
**Where:** Shelby, MI
Type of Tank: Anaerobic Digester Tank
**Size:** 24.62' x 21.17'
**Capacity:** 75,375 Gallons
**Customer:** Oceana Foods
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Brownsville, WI
**Type of Tank:** Anaerobic Digester
**Size:** 33.85' x 25'
**Capacity:** 244,400 Gallons
**Customer:** Grande Cheese
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

**Where:** Fletcher, NC
**Type of Tank:** Digester Tank
**Size:** 107.70' x 25'
**Capacity:** 1,703,482 Gallons
**Customer:** Sierra Nevada Brewing
**Type of Floor:** Concrete
**Type of Roof:** Membrane

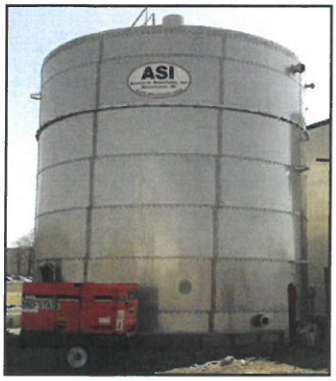
**Where:** Chenango, NY
**Type of Tank:** Aerobic Digester Tank
**Size:** 30.77' x 20.66'
Capacity: 114,913 Gallons
**Customer:** City of Chenango, NY
**Type of Floor:** Concrete
**Type of Roof:** Open Top



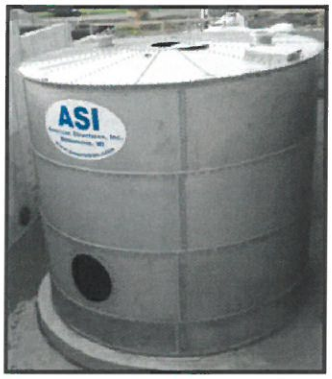
**Where:** Brookshire, TX
**Type of Tank:** Aerobic Digester
Size: 40' x 21.17'
**Capacity:** 471,036 Gallons
**Customer:** Goya Foods
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Delhi, NY
**Type of Tank:** Anaerobic Digester Tank
**Size:** 46.`16' x 44.2'
**Capacity:** 550,572 Gallons
**Customer:** Morningstar Foods/ Dean Foods
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel

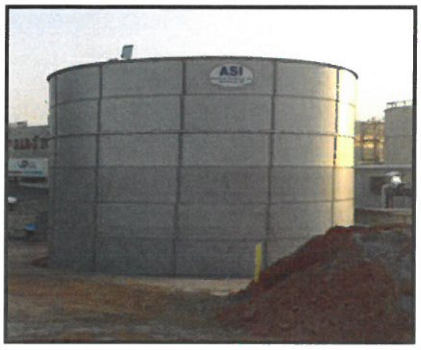
# Equalization Tanks



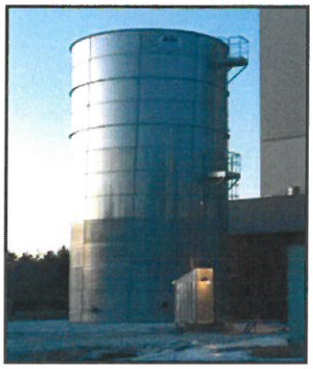

**Where:** Cortland, NY
**Type of Tank:** Equalization Tank
**Size:** 24.62' x 22.5'
**Capacity:** 75,5000 Gallons
**Customer:** Byrne Dairy Yogurt Plant
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



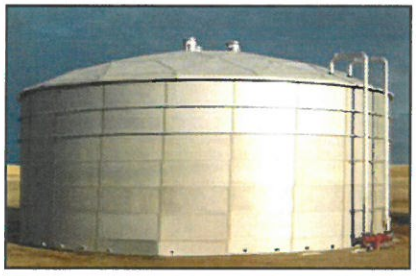

**Where:** Litchfield, MN
**Type of Tank:** (2) Equalization Tanks
**Size:** Both, 64.62' x 21.17'
**Capacity:** Both, 519,316 Gallons
**Customer:** City of Litchfield, MN
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Aluminum, Geodesic Dome




**Where:** Clinton, OK
**Type of Tank:** Equalization Tank
**Size:** 40' x 24.5'
**Capacity:** 230,325 Gallons
**Customer:** Bar-S Foods
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch, Stainless Steel



**Where:** Middlebury, VT
**Type of Tank:** Equalization Tank
**Size:** 27.69' x 47.5
**Capacity:** 202,230 Gallons
**Customer:** Agri-Mark, Inc.
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch, Stainless Steel

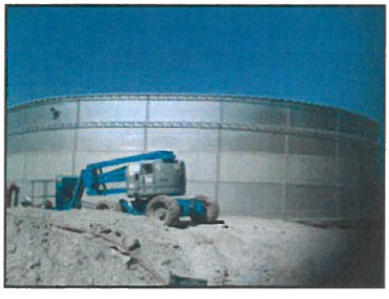


**Where:** St. Joseph, MO
**Type of Tank:** Equalization Tank
**Size:** 36.92' x 21.17'
**Capacity:** 169,581 Gallons
**Customer:** Hillshire Brands
**Type of Floor:** Bolted, Stainless Steel Floor
**Type of Roof:** Aluminum, Geodesic Dome

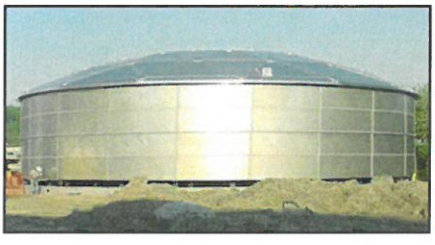

**Where:** Traverse City, MI
**Type of Tank:** Equalization Tank
**Size:** 46.15' x 25'
**Capacity:** 306,560 Gallons
**Customer:** Hillshire Brands
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

**Where:** Dundee, MI
**Type of Tank:** (2) Equalization Tanks
**Sizes:** (Both) 36.90' x 20'
**Capacity:** (Both) 169,581 Gallons
**Customer:** Chrysler Corp.
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch Stainless Steel

**Where:** Batavia, NY
**Type of Tanks:** (Both) Equalization Tank
**Sizes:** (Both) 33.85 x 25'
**Capacity:** (Both) 168,300 Gallons
**Customer:** O-AT-KA
**Type of Floor:** Concrete
**Type of Roof:** Open Top



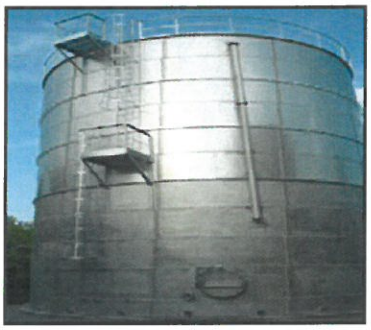
**Where:** Gadsden, AL
**Type of Tank:** Equalization Tank
**Size:** 80.2' x 16.7'
**Capacity:** 601,584 Gallons
**Customer:** Keystone Foods
**Type of Floor:** Concrete



**Where:** Lowville, NY
**Type of Tank:** Equalization Tank
**Size:** 64.62' X 32.67'
**Capacity:** 801,400 Gallons
**Customer:** Kraft Foods
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

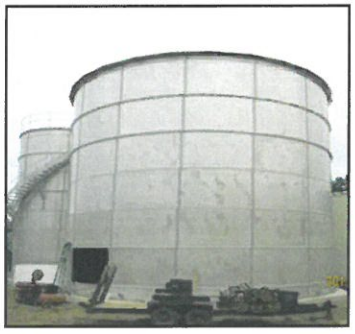
# Equalization Tanks

**Where:** Clayton, NC
**Type of Tank:** Equalization Tank
**Size:** 40' x 47'
**Capacity:** 441,753 Gallons
**Customer:** Grifols Therapeutics
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Aluminum, Geodesic Dome



**Where:** Lowville, NY
**Type of Tank:** Equalization Tank
**Size:** 33.85' x 40.33'
**Capacity:** 271,643 Gallons
**Customer:** Kraft Foods
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch, Stainless Steel

**Where:** LeMars, IA
**Type of Tank**: Equalization Tank
**Size:** 67.7' x 25'
**Capacity:** 673,000 Gallons
**Customer:** River City Egg
**Type of Floor:** Stainless Steel
**Type of Roof:** Aluminum, Geodesic Dome

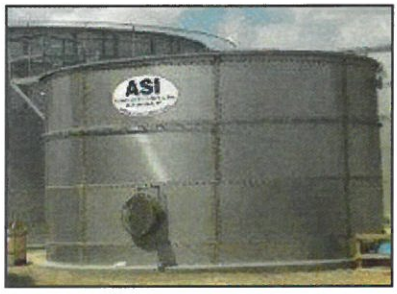


**Where:** Northampton, MA
**Type of Tank:** Equalization Tank
**Size:** 41.96' x 30.17'
**Capacity:** 312,080 Gallons
**Customer:** Coca Cola Refreshments
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Aluminum, Geodesic Dome

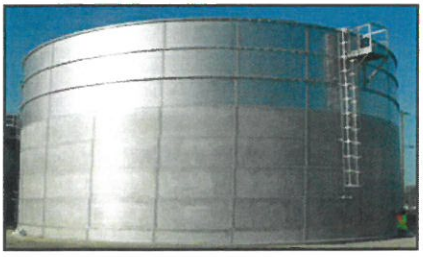
**Where:** Brookshire, TX
**Type of Tank:** Equalization Tank
**Size:** 61.63' x 21.17'
Capacity: 471,036 Gallons
**Customer:** Goya Foods
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Tampa, FL
**Type of Tank:** Equalization Tank
**Size:** 47' x 33'
**Capacity:** 430,000 Gallons
**Customer:** Coca Cola
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch, Stainless Steel

**Where:** Slidell, LA
**Type of Tank:** Equalization Tank
**Size:** 27.69' x 17.33'
**Capacity:** 78,089 Gallons
**Customer:** Huntwyck WWTP
**Type of Floor:** Concrete
**Type of Roof:** Open Top



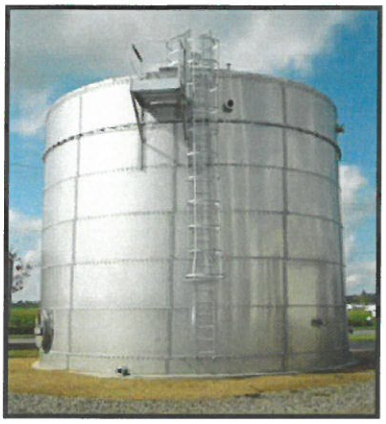

**Where:** Brookshire, TX
**Type of Tank:** Equalization Tank
**Size:** 24.62' x 13.5'
**Capacity:** 48,370 Gallons
**Customer:** Goya Foods
**Type of Floor:** Concrete
**Type of Roof:** Open Top



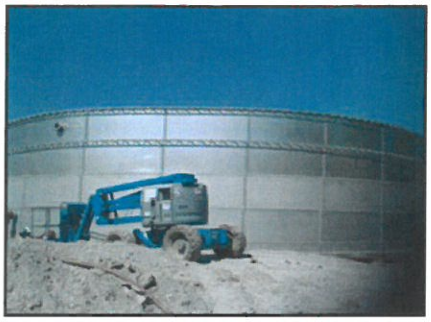
**Where:** Auburndale, FL
**Type of Tank:** Equalization Tank
**Size:** 67.69' x 32.17'
**Capacity:** 780,413 Gallons
**Customer:** Coca Cola
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Fletcher, NC
**Type of Tank:** Equalization Tank
**Size:** 52.31' x 25'
**Capacity:** 316,535 Gallons
**Customer:** Sierra Nevada Brewing
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

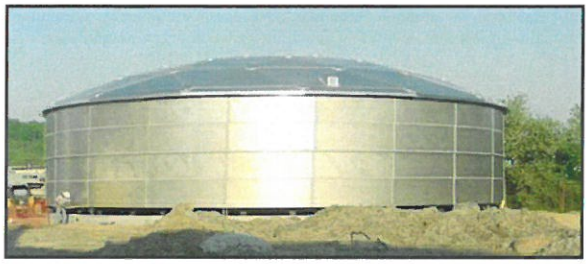
# Equalization & Leachate Tanks



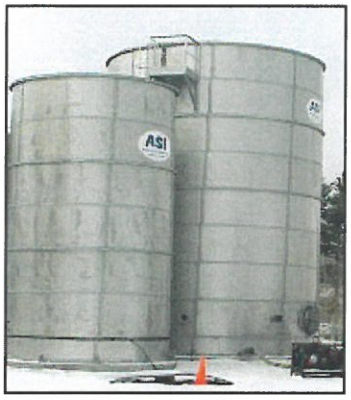
**Where:** Turtle Lake, WI
**Type of Tank:** Equalization Tank
**Size:** 30.77' x 25'
**Capacity:** 136,269 Gallons
**Customer:** Lake Country Dairy
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



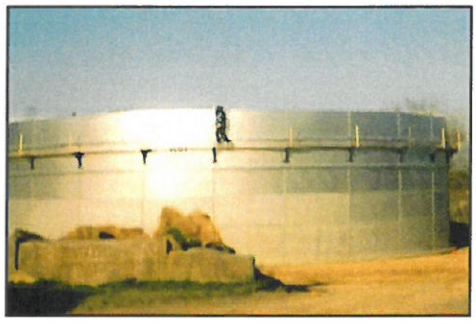
**Where:** Gadsden, AL
**Type of Tank:** Equalization Tank
**Size:** 80.2' x 16.7'
**Capacity:** 601,584 Gallons
**Customer:** Keystone Foods
**Type of Floor:** Concrete



**Where:** Lowville, NY
**Type of Tank:** Equalization Tank
**Size:** 64.62' X 32.67'
**Capacity:** 801,400 Gallons
**Customer:** Kraft Foods
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

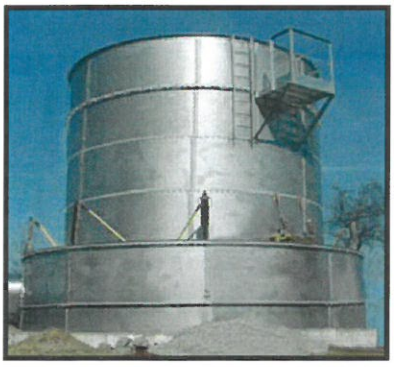


**Where:** N. Lawrence, NY
**Type of Tank:** Equalization Tanks
**Sizes:** 15.39' x 32.67' & 24.64' x 32.67'
**Capacities:** 45,441 and 116,318 Gallons
**Customer:** Cool Brands
**Type of Floor:** Both, Bolted, Stainless Steel
**Type of Roof:** Both, Open Top

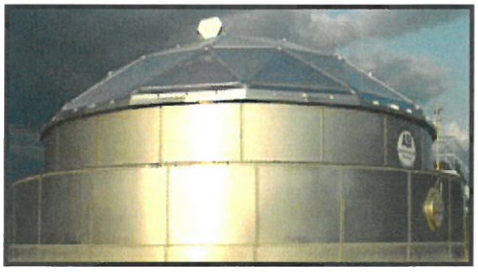


**Where:** Albertville, AL
**Type of Tank:** Equalization Tank
**Size:** 73.85' x 21.17'
**Capacity:** 678,285 Gallons
**Customer:** Tyson Foods
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Lawton, OK
**Type of Tank:** (2) Equalization Tanks
**Size:** Both, 36.93' x 19.33
**Capacity:** Both, 154,840 Gallons
**Customer:** Bar-S Foods
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

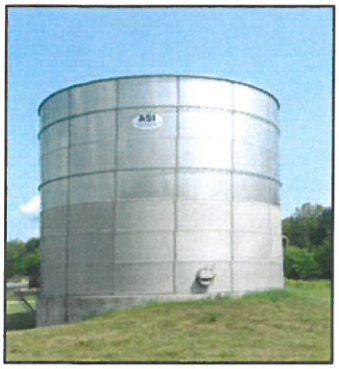


**Where:** Parkersburg, WV
**Type of Tank:** Leachate Storage Tank
**Size:** 21.45' x 21.33'
**Capacity:** 58,146 Gallons
**Customer:** Du Pont
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Open Top



**Where:** Glencoe, MN
**Type of Tank:** Leachate Tank, w/ Containment Ring
**Size:** 61.54' x 10'
**Capacity:** 220,000 Gallons
**Customer:** Spruce Ridge Waste Management
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

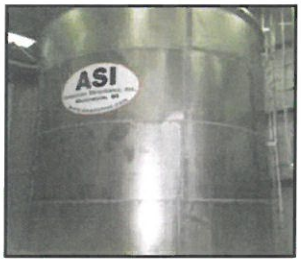
# Sludge Storage Tanks



**Where:** Fall Creek, WI
**Type of Tank:** Sludge Storage Tank
**Size:** 41.92' x 32.55'
**Capacity:** 336,796 Gallons
**Customer:** Village of Fall Creek, WI
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Le Mars, IA
**Type of Tank:** Sludge Storage Tank
**Size:** 8' x 30'
**Capacity:** 11,279 Gallons
**Customer:** City of Le Mars, IA
**Type of Floor:** Welded, Stainless Steel
**Type of Roof:** Welded, Stainless Steel

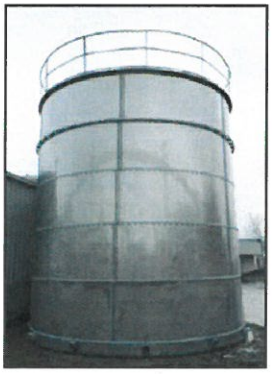
**Where:** Pauls Valley, OK
**Type of Tank:** Sludge Storage Tank
**Size:** 55.39' X 29.83'
**Capacity:** 519,597 Gallons
**Customer:** City of Pauls Valley, OK
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome



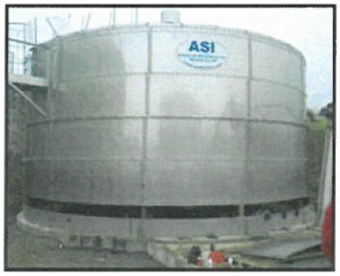

**Where:** Buffalo, WV
**Type of Tank:** Sludge Storage Tank
**Size:** 15.4' x 16'
**Capacity:** 24,000 Gallons
**Customer:** Toyota
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 1:12 Pitch Stainless Steel

**Where:** North Baltimore, OH
**Type of Tank:** Sludge Storage Tank
**Size:** 5' x 5, with cone bottom
**Capacity:** 900 Gallons
**Customer:** Keystone Foods
**Type of Floor:** Welded Stainless Steel
**Type of Roof:** Welded Stainless Steel

**Where:** Spencer, WI
**Type of Tank:** Sludge Storage Tank
**Size:** 26.48' x 25'
**Capacity:** 112,350 Gallons
**Customer:** Land O Lakes
**Type of Floor:** Welded Stainless Steel
**Type of Roof:**



**Where:** Gypsum, OH
**Type of Tank:** Sludge Storage Tank
**Size:** 18.46' x 20'
**Capacity:** 40,040 Gallons
**Customer:** US Gypsum
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 1:12 Pitch Stainless Steel




**Where:** Hersey, PA
**Type of Tank:** Sludge Storage Tank
**Size:** 36.92' x 36.5
**Capacity:** 470,00 Gallons
**Customer:** Derry Township
**Type of Floor:** Concrete
**Type of Roofs** Open Top

**Where:** Osage, IA
**Types of Tanks:** Sludge Storage Tanks
**Sizes:** (3)-24.62' x 25' (2)-76.93' x 36.5'
**Capacities:** 89,010 and 1,268,939 Gallons
**Customer:** River City Egg

**Types of Floors:** All Concrete
**Types of Roofs:** 21.5° Knuckle Style Stainless Steel and Aluminum Geodesic Domes

**Where:** Litchfield, MN
**Types of Tanks:** Sludge Storage Tank
**Sizes:** (2)-89.23' x 25'

**Capacity:** Both, 1,169,065 Gallons
**Customer:** Sparboe Egg Farms
**Types of Floors:** Concrete
**Types of Roofs:** Open Top

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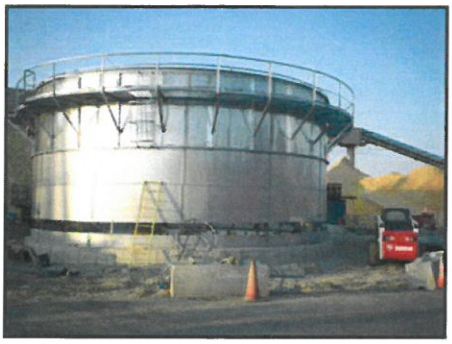
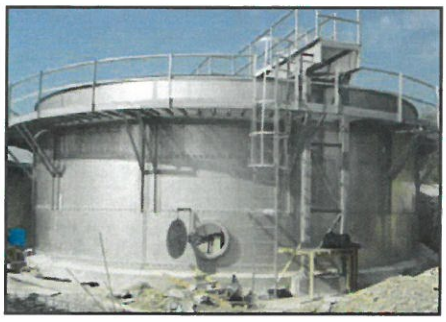
# Sludge Storage Tanks

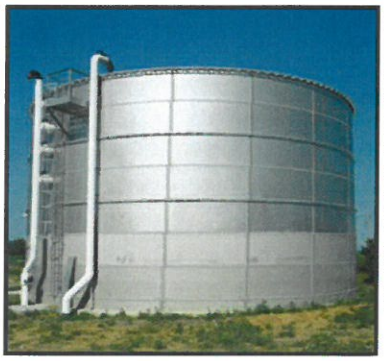


**Where:** Spokane, WA
**Type of Tank:** Sludge Storage Tank
**Size:** (2) 40.32' x 32.67'
**Capacity:** Both, 307,065 Gallons
**Customer:** Inland Empire Paper
**Types of Floors:** Concrete
**Types of Roofs:** Open Top

**Where:** Redwood Falls, MN
**Type of Tank:** (2) - Sludge Storage Tanks
**Sizes:** Both, 80' x 25'
**Capacity:** Both, 940,056 Gallons
**Customer:** Central Bi-Products
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Guadalajara, MX
**Type of Tank:** Aeration Tank
**Size:** 25' x 12.31'
**Capacity:** 22,253 Gallons
**Customer:** Pepsico
**Type of Floor:** Concrete
**Type of Roof:** Open Top

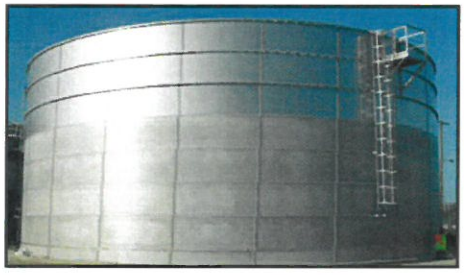


**Where:** Milbank, SD
**Type of Tank:** Sludge Storage Tank
**Size:** 52.31' x 28.83'
Capacity: 461,000 Gallons
**Customer:** City of Milbank, SD
**Type of Floor:** Concrete
**Type of Roofs:** Open Top

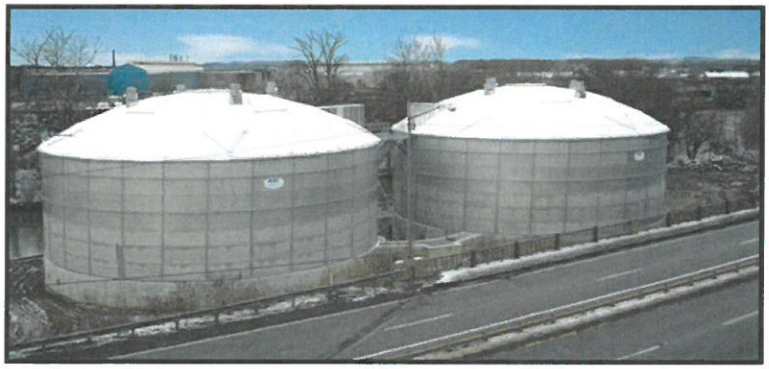
**Where:** Carlisle, PA
**Type of Tank:** Sludge Storage Tank
**Size:** 40' x 23.83'
**Capacity:** 219,772 Gallons
**Customer:** Huntsdale Fish
**Type of Floor:** Concrete
**Type of Roofs:** Open Top

**Where:** Covington, GA
**Type of Tank:** Sludge Storage Tank
**Size:** 61.53' x 26.83'
**Capacity:** 530,000 Gallons

**Customer:** General Mills
**Types of Floors:** Concrete
**Types of Roofs:** Open Top



**Where:** Auburndale, FL
**Type of Tank:** Sludge Storage Tank
**Size:** 36.92' x 32.67'
**Capacity:** 470,000 Gallons
**Customer:** Coca Cola-North America
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel



**Where:** Sharon, PA
**Type of Tank:** (2)-Sludge Storage Tanks
**Sizes:** 89.23' x 27'
**Capacity:** 1,256,494 Gallons, Each
**Customer:** City of Sharon, PA
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome

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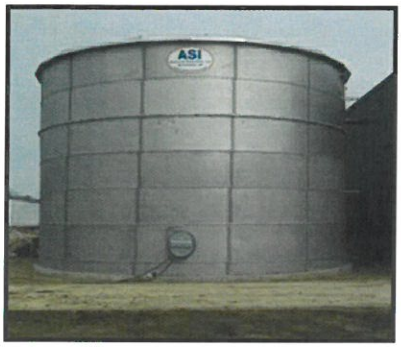
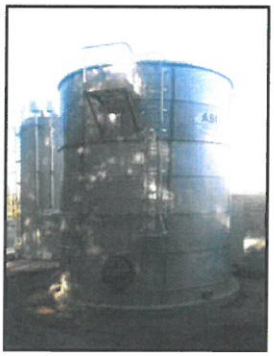
# Waste Water Tanks



**Where:** North East, PA
**Type of Tank:** Waste Water Tank
**Size:** 40' x 25'
**Capacity:** 234,975 Gallons
**Customer:** Bay Valley Foods, LLC
**Type of Floor:** Concrete
**Type of Roof:** Aluminum, Geodesic Dome

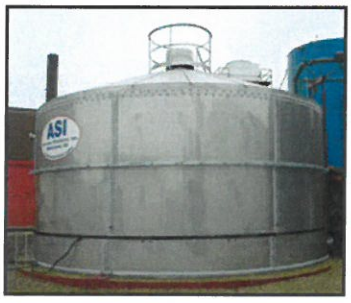


**Where:** McDonough, GA
**Type of Tank:** Waste Water Tank
**Size:** 21.54' x 24.5'
**Capacity:** 66,780 Gallons
**Customer:** DeWafelbakkers
**Type of Floor:** Concrete
**Type of Roof:** Open Top

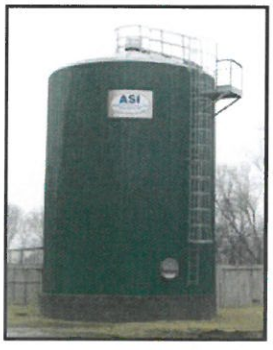
**Where:** Little Chute, WI
**Type of Tank:** Waste Water Tank
**Size:** 47' x 33'
**Capacity:** **430,000 Gallons**
**Customer:** William/Reid LTD, LLC
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** Open Top

**Where:** Saginaw, TX
**Type of Tanks:** (2) Waste Water Tanks
**Size: (Both) 15.38' x 25'**
**Capacities:** (Both) 34,750 Gallons
**Customer:** CTI Bean, Co.
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

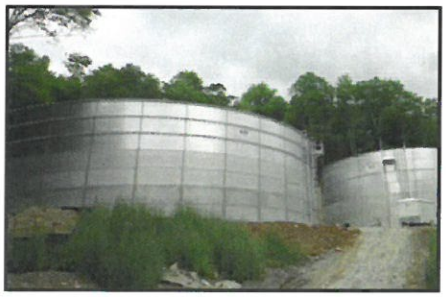
**Where:** Newport News, VA
**Type of Tank:** Waste Water Tank
**Size:** 30.77' x 17.33'
**Capacity:** 96,389 Gallons
**Customer:** High Liner Foods
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel



**Where:** Zumbrota, MN
**Type of Tank:** Waste Water Tank
**Size:** 21.54' x 17.33'
**Capacity:** 47.250 Gallons
**Customer:** DFA Zumbrota, MN
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 21.5° Knuckle Style, Stainless Steel



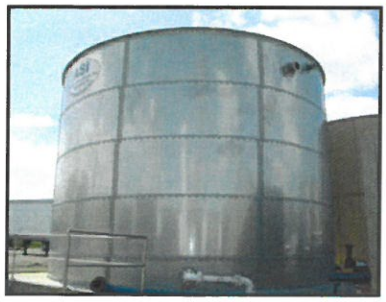
**Where:** Ellsworth, WI
**Type of Tank:** Insulated Waste Water Tank
**Size:** 21.54' x 28.83'
**Capacity:** 78,590 Gallons
**Customer:** Ellsworth Creamery
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style, Stainless Steel



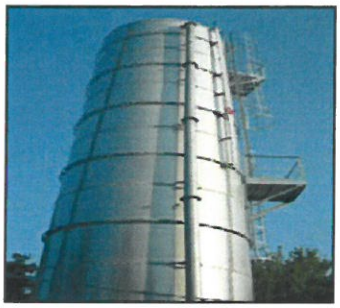
**Where:** Boone, NC
**Type of Tank:** (2) Waste Water Tank
**Sizes**: 101.54' x 27.81' and 58.46' x 29.33'
**Capacities:** 1,685,718 Gallons and 588,877 Gallons
**Customer:** Cottage of Boone
**Type of Floor:** (Both) Concrete
**Type of Roof:** (Both) Open Top

**Where:** Lake Villa, IL
**Types of Tanks:** Waste Water Tanks
**Sizes:** (3) 7.64' x 18, (1) 21.54' x (1) 28'/15.68' x 25'
**Capacities:** 8,000, 78,500, and 34,773 Gallons
**Customer:** C & F Packing
**Types of Floors:** Welded Stainless Steel & Bolted Stainless Steel
**Type of Roof:** Welded Stainless Steel & Open Top

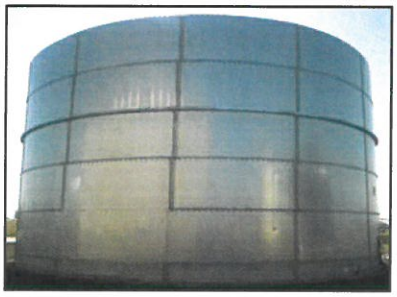
# Waste Water Tanks



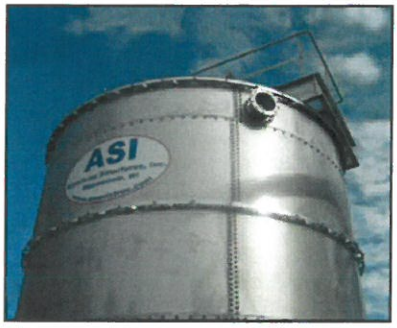
**Where:** Harvard, IL
**Type of Tank:** Waste Water Tank
**Size:** 24.62' x 17'
**Capacity:** 62,093 Gallons
**Customer:** Dean Foods
**Type of Floor:** Concrete
**Type of Roof:** 1:12 Pitch Stainless Steel



**Where:** Hyden, KY
**Type of Tank:** Waste Water Tank
**Size:** 33.83' x 25.16'
**Capacity:** 168,300 Gallons
**Customer:** Hyden-Leslie County Waster Disctrict
**Type of Floor:** Concrete
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

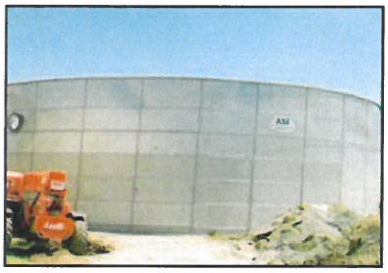


**Where:** Jerome, ID
**Type of Tank:** Waste Water Tank
**Size:** 40' x 28.83'
**Capacity:** 271,032 Gallons
**Customer:** Idaho Milk Products
**Type of Floor:** Concrete
**Type of Roof:** Stainless Steel Welded Roof




**Where:** Pueblo, CO
**Type of Tank:** Waste Water Tank
**Size:** 15.38' x 19'
**Capacity:** 26,400 Gallons
**Customer:** Rocky Mountain Steel Mill
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** Open Top

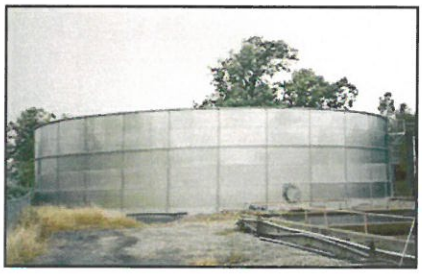
**Where:** Wyalusing, PA
**Type of Tanks** Waste Water Tanks
**Size:** (Both) 27.69' x 28.83'
**Capacity:** 129,952 Gallons
**Customer:** Cargill Beef
**Type of Floor:** Stainless Steel
**Type of Roof:** 21.5° Knuckle Style Stainless Steel



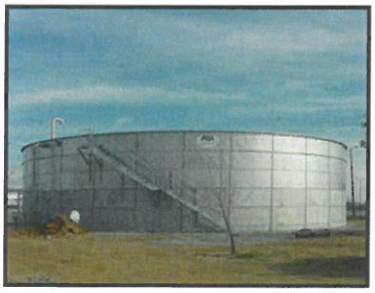
**Where:** Sedalia, MO
**Type of Tank:** Waste Water Tank
**Size:** 89.23' x 25'
**Capacity:** 1,169,502 Gallons
**Customer:** Tyson Foods, Inc.
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Sacramento, CA
**Type of Tank:** Waste Water Tank
**Size:** 9.5' x 12'
**Capacity:** 6,400 Gallons
**Customer:** Stephens Construction
**Type of Floor:** Stainless Steel
**Type of Roof:** Welded Stainless Steel

**Where:** Kansas City, MO
**Type of Tank:** Waste Water Tank
**Size:** 15.8' x 4' x 4'
**Capacity:** 1,875 Gallons
**Customer:** Kellogg Foods
**Type of Floor:** Welded Stainless Steel
**Type of Roof:** Welded Stainless Steel



**Where:** Canandaigua, NY
**Type of Tank:** Waste Water Tank
**Size:** 92.3' x 20.83'
**Capacity:** 1,001,200 Gallons
**Customer:** Canandaigua Winery
**Type of Floor:** Concrete
**Type of Roof:** Open Top



**Where:** Vienna, GA
**Type of Tank:** Waste Water Tank
**Size:** 89.23' x 21.17'
**Capacity:** 990,226 Gallons
**Customer:** Tyson Foods, Inc.
**Type of Floor:** Concrete
**Type of Roof:** Open Top

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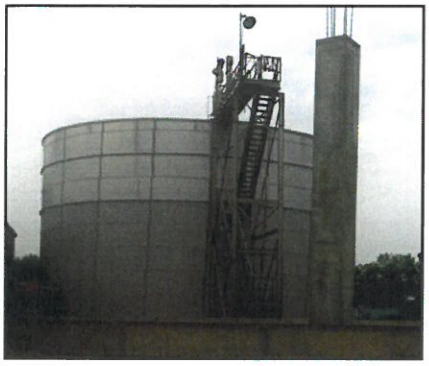
# Filter & Fire Water Tanks

## Other Types of Miscellaneous Tanks

Due to American Structures, Inc's unique capability to be able to design, fabricate, and erect a variety of tanks, silos and stand-pipes of al kinds, we have a number os storage tank options that are specialized in their application. Some examples of these types of tanks are:

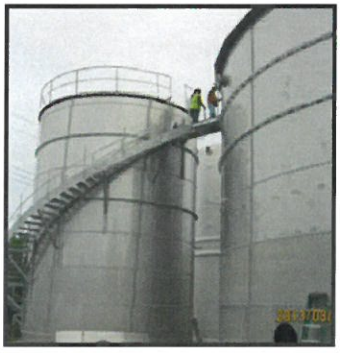
- Filter Tanks
- Fire Water Tanks
- Bio Towers
- Hot Water Tanks
- Condensate Tanks



**Where:** Eddyville, IA
**Type of Tank:** Filter Tank
**Size:** 61.53' x 34.64'
**Capacity:** 970,000 Gallons
**Customer:** Cargill Corn Milling
**Type of Floor:** Concrete
**Type of Roof:** Open Top

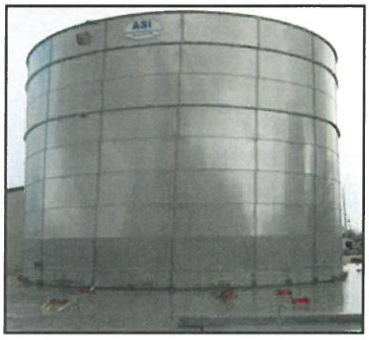
**Where:** Eddyville, IA
**Type of Tank:** Filter Tank
**Size:** 61.53' x 34.64'
**Capacity:** 970,000 Gallons
**Customer:** Cargill Corn Milling
**Type of Floor:** Concrete
**Type of Roof:** Open Top

**Where:** Fayetteville, NC
**Type of Tank:** Filter Tank
**Size:** 55.39' x 14.83'
**Capacity:** 250,000 Gallons
**Customer:** E.I. DuPont de Nemours & Co.
**Type of Floor:** Bolted, Stainless Steel Floor
**Type of Roof:** 21.5° Knuckle Style Steel

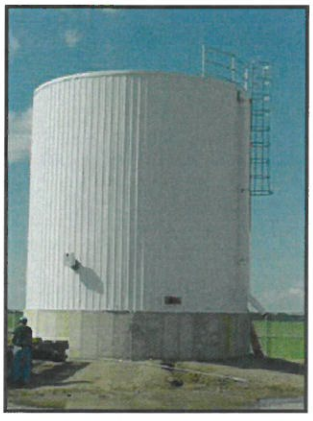


**Where:** Northampton, MA
**Type of Tank:** Filter Tank
**Size:** 21/54' x 30.17'
**Capacity:** 82,240 Gallons
**Customer:** Coca Cola Refreshments
**Type of Floor:** Bolted, Stainless Steel
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel

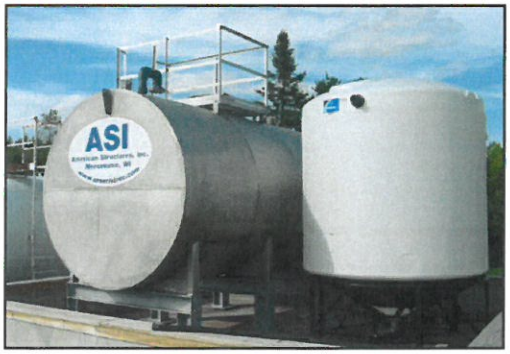
**Where:** Waupon, WI
**Type of Tank:** Insulated Fire Water Tank
**Size:** 52.31' x 25'
**Capacity:** 401,899 Gallons
**Customer:** Saputo Cheese
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome



**Where:** Gary, LA
**Type of Tank:** Fire Water Tank
**Size:** 49.23' x 32.67'
**Capacity:** 465,155 Gallons
**Customer:** Air Products
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** Flat, Bolted Stainless Steel



**Where:** Spicer, MN
**Type of Tank:** Insulated Fire Water Tank
**Size:** 24.62' x 25'
**Capacity:** 89,000 Gallons
**Customer:** Kandiyohi Power
**Type of Floor:** Bolted Stainless Steel
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel




**Where:** Ely, MN
**Type of Tank:** Fire Water Tank
**Size:** 8' x 14'
**Capacity:** 5,000 Gallons
**Customer:** US Department of AG Forest Service
**Type of Floor:** Welded Stainless Steel
**Type of Roof:** Welded Stainless Steel

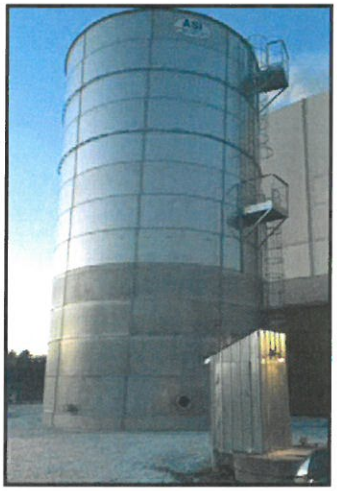
# Tanks with Protective Rhino® Coatings

In addition to the manufacture and erection of bolted, stainless steel tanks, American Structures, Inc. is also a distributor of Rhino® Linings Industrial Coatings and Structural Composites.
As such, we offer Rhino® Linings Corporation's elastomeric polyurethane, polyuria, and hybrid coatings that provide the maximum in protection, when combined with our bolted, stainless steel tanks.
These Rhino® Linings applications include, but are not limited to: construction, manufacturing, marine, the military, municipal, roofing, theme park, and transportation industries.

**Where:** Cortland, NY
**Type of Tank:** Equalization Tank
**Size:** 24.62' x 22.5'
**Capacity:** 75,500 Gallons
**Customer:** Byrne Dairy Yogurt Plant
**Type of Floor:** Concrete , w/ Rhino® Hi-Chem Lining
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** Egg Harbor, NJ
**Type of Tank:** Clearwell Tank
**Size:** 22.5' x 29.6'
**Capacity:** 82,458 Gallons
**Customer:** City of Egg Harbor WTP
**Type of Floor:** Concrete, w/ Rhino® Hi-Chem Lining
**Type of Roof:** 21.5° Knuckle Style Stainless Steel

**Where:** North East, PA
**Type of Tank:** Waste Water Tank
**Size:** 40' x 25'
**Capacity:** 230,975 Gallons
**Customer:** Bay Valley Foods
**Type of Floor:** Concrete, w/Rhino® Hi-Chem Lining
**Type of Roof:** Aluminum Geodesic Dome



**Where:** Middlebury, VY
**Type of Tank:** Equalization Tank
**Size:** 27.69' x 47.5'
**Capacity:** 202,230 Gallons
**Customer:** Ari-Mark, Inc.
**Type of Floor:** Concrete, w/Rhino® Hi-Chem Lining
**Type of Roof:** 1:12 Pitch Bolted Stainless Steel

**Where:** Fayetteville, NC
**Type of Tank:** Filter Tank
**Size:** 55.39' x 14.83'
**Capacity:** 250,000 Gallons
**Customer:** E.I. Du Pont de Nemours & Co.
**Type of Floor:** Bolted, Stainless Steel w/Rhino® Hi-Chem Lining
**Type of Roof:** 1:12 Pitch, Bolted Stainless Steel

**Where:** Luxemburg, WI
**Type of Tank:** Anoxic Digester and Aeration Tank
**Size:** 33.57' x 28.33' and **100.71' x 18.67'**
**Capacity: 190,689 and 1,147,000 Gallons**
**Customer: Agropur, Inc.**
**Type of Floor: Concrete, w/ Rhino® Hi-Chem Lining**
**Type of Roof:** Open Top

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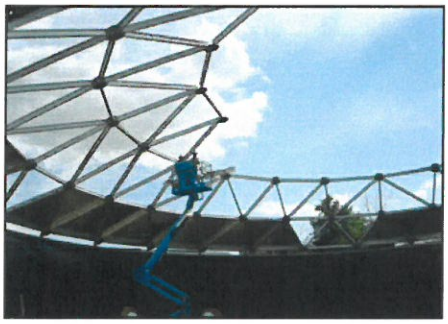
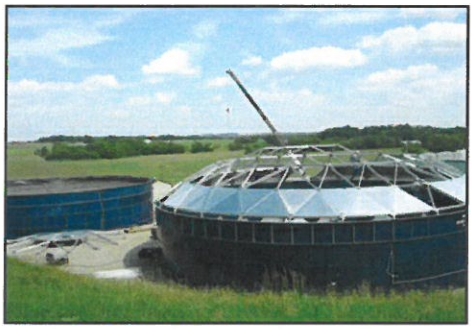
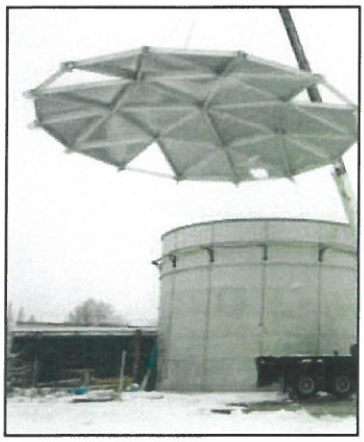
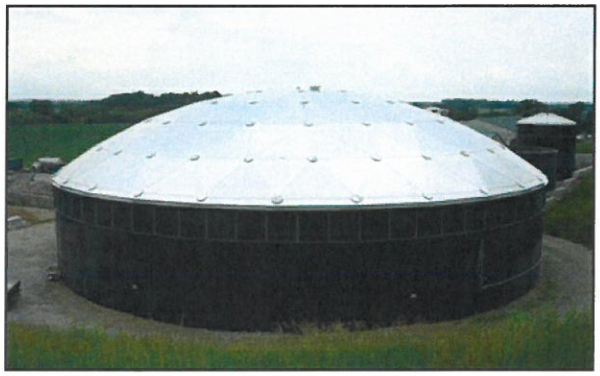
## Roofs & Domes

No matter what the need, we can provide a roof for your specific project. Whether it be a stainless steel 1:12 pitch roof, an aluminum dome, or a retrofit on an existing tank, we have the experience to get the job done and done right.









# Stainless Steel Replacement Roofs

## Roof sizes available to fit:

Cropstore™ Silos 20', 25' and 26'
Sealstor Silos 15', 18', 21', 24' and 27'
Harvestore® Silos 14', 17', 20', 25', 31' and 36'



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## Get a Quote


# American Structures, Inc.

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715-235-4225
Fax 715-235-6212


**This form is also available on our website www.ameristruc.com**
**Click on "Quote" and go to "Tank Bid Form" and submit via email.**

| Standard Tank Diameters | Gallons Per Foot |
|---|---|
| 12.31′ | 890 |
| 15.38′ | 1,390 |
| 18.46′ | 2,002 |
| 21.54′ | 2,726 |
| 24.62′ | 3,583 |
| 27.69′ | 4,494 |
| 30.77′ | 5,562 |
| 33.85′ | 6,731 |
| 36.92′ | 8,008 |
| 40.00′ | 9,399 |
| 43.07′ | 10,898 |
| 46.15′ | 12,513 |
| 49.23′ | 14,238 |
| 52.31′ | 16,075 |
| 55.39′ | 18,027 |
| 58.46′ | 20,078 |
| 61.53′ | 22,242 |
| 64.61′ | 24,524 |
| 67.69′ | 26,918 |
| 70.77′ | 29,423 |
| 73.85′ | 32,040 |
| 76.92′ | 34,760 |
| 80.00′ | 37,599 |
| 83.07′ | 40,540 |
| 86.16′ | 43,612 |
| 89.23′ | 46,775 |
| 92.31′ | 50,060 |
| 95.39′ | 53,445 |
| 98.46′ | 56,953 |
| 101.54′ | 60,572 |
| 110.77′ | 72,088 |
| 120.0′ | 84,597 |
| 129.23′ | 98,118 |
| 150.77′ | 133,543 |
| 203.08′ | 424,301 |
| 209.23′ | 257,182 |

Company: _____

Contact: _____

Address: _____

City/state/zip code: _____

Telephone: _____ fax: _____

Email: _____

**PLEASE FILL OUT THE APPLICABLE DESIGN CRITERIA, BELOW:**

(We will bid the most cost-effective tank for you based on the capacity required and diameter limitations requested. We will also size for height.)

Tank capacity: _____

Diameter: _____

Height: _____

Material to be stored: _____

Weight/volume: _____

## TANK OPTIONS

| | Yes | No |
|---|---|---|
| Roof | ○ | ○ |
| Roof Vent | ○ | ○ |
| Roof Manway | ○ | ○ |
| Ladder, with safety cage | ○ | ○ |
| Ladder (inside) | ○ | ○ |
| Ladder, with platform | ○ | ○ |
| Spiral Staircase | ○ | ○ |
| Wall Manway | ○ | ○ |

FLOOR

Stainless Steel: ..... ○

Concrete: ..... ○

NOZZLES:

| | | | |
|---|---|---|---|
| Size: | | Quantity: | |
| Size: | | Quantity: | |
| Size: | | Quantity: | |
| Size: | | Quantity: | |
| Size: | | Quantity: | |

Comments or Additional Information:

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# Tank Volume Worksheet

| TANK DIAMETER IN | TANK HEIGHT IN FEET | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5.83 | 9.67 | 13.5 | 17.33 | 21.17 | 25 | 28.83 | 32.57 | 36.5 | 40.33 |
| 12.31 | 5,190 | 8,609 | 12,018 | 15,428 | 18,846 | 22,256 | 25,666 | 29,084 | 32,494 | 35,903 |
| 15.39 | 15.39 | 13,450 | 18,777 | 24,104 | 29,446 | 34,773 | 40,100 | 45,441 | 50,768 | 56,095 |
| 18.46 | 11,676 | 19,367 | 27,038 | 34,709 | 42,400 | 50,071 | 57,741 | 65,432 | 73,103 | 80,774 |
| 21.54 | 15,892 | 26,360 | 36,801 | 47,241 | 57,709 | 68,149 | 78,590 | 89,058 | 99,498 | 109,939 |
| 24.62 | 20,757 | 34,429 | 48,065 | 61, 701 | 75,373 | 89,010 | 102,646 | 116,318 | 129,954 | 143,590 |
| 27.69 | 26, 270 | 43,573 | 60,831 | 78,089 | 95,393 | 112,651 | 129,909 | 147,212 | 164,470 | 181,728 |
| 30.77 | 32,432 | 53,793 | 75,099 | 96,405 | 117,767 | 139,073 | 160,379 | 181,740 | 203,046 | 224,352 |
| 33.85 | 39,242 | 65,089 | 90,869 | 116,649 | 142,496 | 168,276 | 194,056 | 219,903 | 245,683 | 271,463 |
| 36.93 | 46,701 | 77,461 | 108,141 | 138,821 | 169,581 | 200,260 | 230,940 | 261,700 | 292,380 | 323,060 |
| 40.00 | 54,808 | 90,908 | 126,914 | 162,920 | 199,020 | 235,026 | 271,032 | 307,132 | 343,138 | 379,144 |
| 43.08 | 63,564 | 105,431 | 147,189 | 188,947 | 230,814 | 272,572 | 314,331 | 356,198 | 397,956 | 439,714 |
| 46.16 | 72,968 | 121,030 | 168,966 | 216,902 | 264,964 | 312,900 | 360,836 | 408,898 | 456,834 | 504,770 |
| 49.23 | 83,021 | 137,704 | 192,245 | 246,785 | 301,468 | 356,009 | 410,549 | 465,323 | 519,773 | 574,313 |
| 52.31 | 93,723 | 155,454 | 217,025 | 278,596 | 340,328 | 401,899 | 463,470 | 525,201 | 586,772 | 648,343 |
| 55.39 | 105,073 | 174,280 | 243,308 | 312,335 | 381,542 | 450,570 | 519,597 | 588,804 | 657,832 | 726,859 |
| 58.46 | 117,071 | 194,182 | 271,092 | 348,001 | 425,112 | 502,022 | 578,931 | 656,042 | 732,952 | 809,861 |
| 61.54 | 129,719 | 215,159 | 300,378 | 385,596 | 471,036 | 556,255 | 641,473 | 726,914 | 812,132 | 897,350 |
| 64.62 | 143,014 | 237,212 | 331,165 | 425,118 | 519,316 | 613,269 | 707,222 | 801,420 | 895,373 | 989,325 |
| 67.70 | 156,959 | 260,341 | 363,455 | 466,568 | 569,951 | 673,064 | 776,178 | 879,560 | 982,674 | 1,085,787 |
| 70.77 | 171,551 | 284,546 | 397,246 | 509,946 | 622,940 | 735,641 | 848,341 | 961,335 | 1,074,035 | 1,186,735 |
| 73.85 | 186,793 | 309,826 | 432,539 | 555,252 | 678,285 | 800,998 | 923,711 | 1,046,744 | 1,169,457 | 1,292,170 |
| 76.93 | 202,683 | 336,182 | 469,334 | 602,485 | 735,985 | 869,137 | 1,002,288 | 1,135,788 | 1,268,939 | 1,402,091 |
| 80.00 | 219,221 | 363,614 | 507,630 | 651,647 | 796,040 | 940,056 | 1,084,073 | 1,228,465 | 1,372,482 | 1,516,499 |
| 83.08 | 236,408 | 392,121 | 547,429 | 702,736 | 858,449 | 1,013,757 | 1,169,065 | 1,324,778 | 1,480,085 | 1,635,393 |
| 86.16 | 254,244 | 421,704 | 588,729 | 755,754 | 923,214 | 1,090,239 | 1,257,263 | 1,424,724 | 1,591,749 | 1,758,773 |
| 89.23 | 272,728 | 452,363 | 631,531 | 810,699 | 990,334 | 1,169,502 | 1,348,669 | 1,528,305 | 1,707,473 | 1,886,640 |
| 92.31 | 291,860 | 484,098 | 675,835 | 867,572 | 1,059,809 | 1,251,546 | 1,443,283 | 1,635,520 | 1,827,257 | 2,018,994 |
| 95.39 | 311,642 | 516,908 | 721,640 | 926,372 | 1,131,639 | 1,336,371 | 1,541,103 | 1,746,369 | 1,951,101 | 2,155,833 |
| 98.47 | 332,071 | 550,794 | 768,948 | 987,101 | 1,205,824 | 1,423,977 | 1,642,130 | 1,860,853 | 2,079,006 | 2,297,160 |
| 101.54 | 353,150 | 585,756 | 817,757 | 1,049,757 | 1,282,364 | 1,514,364 | 1,746,365 | 1,978,971 | 2,210,972 | 2,442,973 |
| 104.62 | 374,877 | 621,794 | 868,068 | 1,114,342 | 1,361,259 | 1,607,533 | 1,853,807 | 2,100,724 | 2,346,998 | 2,593,272 |

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# Tank Volume Worksheet Continued

| TANK DIAMETER IN | TANK HEIGHT IN FEET | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5.83 | 9.67 | 13.5 | 17.33 | 21.17 | 25 | 28.83 | 32.57 | 36.5 | 40.33 |
| 107.70 | 397,252 | 919,880 | 658,907 | 1,180,854 | 1,442,509 | 1,703,482 | 1,964,456 | 2,226,100 | 2,487,084 | 2,748,057 |
| 110.77 | 420,276 | 697,096 | 973,195 | 1,249,294 | 1,526,114 | 1,802,213 | 2,078,312 | 2,355,132 | 2,631,231 | 2,907,330 |
| 113.85 | 443,949 | 736,361 | 1,028,011 | 1,319,662 | 1,612,074 | 1,903,724 | 2,195,375 | 2,487,787 | 2,779,438 | 3,071,088 |
| 116.93 | 468,270 | 776,701 | 1,084,329 | 1,391,957 | 1,700,389 | 2,008,017 | 2,315,645 | 2,624,077 | 2,931,705 | 3,239,333 |
| 120.00 | 493,239 | 818,117 | 1,142,1149 | 1,466,181 | 1,791,059 | 2,115,091 | 2,439,123 | 2,764,001 | 3,088,033 | 3,412,065 |
| 123.08 | 518,857 | 860,609 | 1,201,471 | 1,542,332 | 1,884,084 | 2,224,946 | 2,565,808 | 2,907,559 | 3,248,421 | 3,589,283 |
| 126.16 | 545,124 | 904,177 | 1,262,294 | 1,620,412 | 1,979,464 | 2,337,582 | 2,695,699 | 3,054,752 | 3,412,870 | 3,770,987 |
| 129.24 | 572,039 | 948,820 | 1,324,619 | 1,700,419 | 2,077,200 | 2,452,999 | 2,828,798 | 3,205,579 | 3,581,379 | 3,957,178 |
| 132.31 | 599,603 | 994,539 | 1,388,446 | 1,782,354 | 2,177,290 | 2,571,197 | 2,965,105 | 3,360,040 | 3,753,948 | 4,147,855 |
| 135.39 | 627,816 | 1,041,334 | 1,453,775 | 1,866,279 | 2,279,735 | 2,692,176 | 3,104,618 | 3,518,136 | 3,390,578 | 4,343,019 |
| 138.47 | 656,676 | 1,089,204 | 1,520,606 | 1,952,007 | 2,384,535 | 2,815,937 | 3,247,338 | 3,679,866 | 4,111,268 | 4,542,669 |
| 141.54 | 686,186 | 1,138,151 | 1,588,938 | 2,039,726 | 2,491,691 | 2,942,478 | 3,393,266 | 3,845,231 | 4,296,018 | 4,746,806 |
| 144.62 | 716,344 | 1,188,173 | 1,658,772 | 2,129,372 | 2,601,201 | 3,071,801 | 3,542,401 | 4,014,229 | 4,484,829 | 4,955,429 |
| 147.70 | 747,151 | 1,239,270 | 1,730,108 | 2,220,947 | 2,713,066 | 3,203,905 | 3,694,743 | 4,186,862 | 4,677,701 | 5,168,539 |
| 150.77 | 778,606 | 1,291,444 | 1,802,946 | 2,314,449 | 2,827,287 | 3,338,789 | 3,805,292 | 4,363,130 | 4,874,632 | 5,386,135 |
| 153.85 | 810,709 | 1,344,693 | 1,877,286 | 2,409,879 | 2,943,862 | 3,476,455 | 4,009,048 | 4,543,032 | 5,075,624 | 5,608,217 |
| 156.93 | 843,462 | 1,399,018 | 1,953,127 | 2,507,237 | 3,062,793 | 3,616,902 | 4,171,011 | 4,171,011 | 5,280,677 | 5,834,786 |
| 160.01 | 876,862 | 1,454,418 | 2,030,470 | 2,606,522 | 3,184,078 | 3,760,130 | 4,336,182 | 4,913,738 | 5,489,790 | 6,065,842 |
| 163.08 | 910,912 | 1,510,895 | 2,109,315 | 2,707,736 | 3,307,719 | 3,905,139 | 4,504,560 | 5,104,543 | 5,702,963 | 6,301,384 |
| 166.16 | 945,610 | 1,568,447 | 2,189,662 | 2,810,877 | 3,433,714 | 4,054,929 | 4,676,145 | 5,298,982 | 5,920,197 | 6,541,412 |
| 169.24 | 980,956 | 1,627,074 | 2,271,510 | 2,915,946 | 3,562,065 | 4,206,501 | 4,850,937 | 5,497, 055 | 6,141,491 | 6,785,927 |
| 172.31 | 1,016,951 | 1,686,778 | 2,354,861 | 3.022,943 | 3,692,770 | 4,360,853 | 5,028,936 | 5,698,763 | 6,366,845 | 7,034,928 |
| 175.39 | 1,053,594 | 1,747,557 | 2,439,713 | 3,131,868 | 3,825,831 | 4,517,987 | 5,210,142 | 5,904,105 | 6,596,260 | 7,288,416 |
| 178.47 | 1,090,887 | 1,809,412 | 2,526,067 | 3,242,721 | 3,961,247 | 4,677,901 | 5,394,556 | 6,113,081 | 6,829,736 | 7,546,390 |
| 181.54 | 1,128,827 | 1,872,343 | 2,613,922 | 3,355,502 | 4,099,017 | 4,840,597 | 5,582,176 | 6,325,692 | 7,067,271 | 7,808,851 |
| 184.62 | 1,167,416 | 1,936,349 | 2,703,280 | 3,470,210 | 4,239, 143 | 5,006,074 | 5,773,004 | 6,541,937 | 7,308,867 | 8,075,798 |
| 187.70 | 1,206,654 | 2,001,431 | 2,794,139 | 3,586,846 | 4,381,624 | 5,174,331 | 5,967,039 | 6,761,816 | 7,554,524 | 8,347,231 |
| 190.78 | 1,246,540 | 2,067,589 | 2,886,500 | 3,705,411 | 4,526,460 | 5,345,370 | 6,164,281 | 6,985,330 | 7,804,241 | 8,623,151 |
| 193.85 | 1,287, 075 | 2,134,823 | 2,980, 363 | 3,825,903 | 4,673,650 | 5,519,190 | 6,364,730 | 7,212,478 | 8,058,018 | 8,903,558 |
| 196.93 | 1,328, 259 | 2,203,132 | 3,075,727 | 3,948,323 | 4,823,196 | 5,695,791 | 6,568,387 | 7,443,260 | 8,315,855 | 9,188,451 |
| 200.01 | 1,370,090 | 2,272,517 | 3,172,594 | 4,072,670 | 4,975,097 | 5,875,174 | 6,775,250 | 7,677,677 | 8,577,753 | 9,477,830 |

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# BOLTED STAINLESS STEEL POTABLE WATER STORAGE TANKS – Nov/2014

## PART 1 – GENERAL

### 1.01 SUMMARY

Scope of Work:
Furnish and erect a stainless steel bolted water storage tank, including foundation, tank structure and tank appurtenances as shown on the submittal drawings and described herein.

All required labor, materials and equipment shall be included.

### 1.02 QUALITY ASSURANCE

A. The type and quality of workmanship shall conform to AWWA standards.
B. Repairs for minor damage, scratches, and abrasions may be made where permitted by the Engineer, in manner recommended by manufacturer.
C. Units damaged beyond repair in the opinion of the Engineer will be rejected and replaced with undamaged units.

### 1.03 SUBMITTAL DRAWINGS AND SPECIFICATIONS

A. Shop Drawings: Furnish in accordance with Section _____. Provide the following information for each material specified within this Section, if applicable, and identify all other materials or equipment, dimensions, components, properties, and other information required to prove compliance with these specifications.
B. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details, after written approval by the Engineer of detailed drawings prepared by the tank bidder.
C. The bidder is required to furnish, for the approval of the Engineer, at no increase in contract price, complete specifications and construction drawings for all work not shown in complete detail on the submittal drawings. A complete set of tank drawings and structural calculations can be provided for the tank structure and foundation. As may be required by the project specifications, contract documents, Owner or Owner's representative, tank drawings and calculations may be stamped by a Professional Engineer licensed in the state of project location.
D. When approved, two sets of such prints and submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.



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E. The tank manufacturer's standard published warranty shall be included with submittal information.
F. The dealer shall include the tank manufacturer's standard Operation and Maintenance Manual upon receipt of final payment.

PART 2 – PRODUCTS

2.01 WATER STORAGE TANK

A. Size – The stainless steel bolted tank shall have a nominal diameter of ____ feet with a nominal sidewall height of _____ feet.
B. Capacity – Tank capacity shall have a minimum capacity of _____ gallons at _____ feet liquid depth.
C. Floor Elevation – Finished floor elevation shall be set to the elevation as shown on the Drawings.
D. Tank Design Standards:

1. The materials, design, fabrication and erection of the bolted steel tank shall conform to the AWWA Standard for "Factory-Coated Bolted Steel Tanks for Water Storage" – ANSI/AWWA D103 latest edition.
2. Design Loads:
    a. Specific Gravity: 1.0.
    b. Design Freeboard:
    c. Wind Velocity: 100 miles per hour per AWWA D103 Standard (latest edition).
    d. Allowable Soil Bearing Capacity: Refer to the Report of Geotechnical Exploration Program for the Proposed Water Storage Reservoir.
    e. Roof Snow Load:
    f. Earthquake Seismic Zone: Per AWWA D103.

E. Approved Manufacturers: American Structures, Inc., Menomonie, WI.

2.02 – MATERIALS

A. Plates and Sheets: Plates and sheets used in the construction of the tank shell, tank floor (when supplied) and tank roof, shall comply with the minimum standards of AWWA D103, latest edition.
B. Rolled Structural Shapes: Material shall conform to minimum standards of AWWA D103, latest edition.
C. Horizontal Wind Stiffeners:

1. Design requirements for intermediate horizontal wind stiffeners shall be of the "web truss" type with an extended tail creating multiple layers of stiffener, permitting wind loads to be distributed around the tank.
2. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
3. Rolled steel angle stiffeners are not permitted for use as horizontal wind stiffeners.

D. Bolt Fasteners
1. All bolts, nuts and washers shall conform to AWWA D103 latest edition, and shall be constructed of Type 304 stainless steel.
2. All bolts on the vertical tank wall shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior. Maximum of ½ inch thread projection beyond the nut.
3. All lap joint bolts shall be properly selected such that threaded portions of the bolts will not be exposed to the "shear plane" between tank sheets.



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4. Bolt lengths shall be sized to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torqueing will not be permitted.
5. All lap joint bolts shall include a minimum of four (4) splines on the underside of the bolt head at the shank in order to resist rotation during torqueing.

E. Roof: Tank designed to support optional roof/dome.

F. Sealants

1. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and shall be certified to meet ANSI/NSF Additives Standard 61 for indirect additives.
2. The sealant shall be used to seal lap joints and bolt connections and edge fillets for sheet notches and starter sheets. The sealant shall cure to a rubber-like consistency, have excellent adhesion to the sheets, low shrinkage, and be suitable for interior and exterior use.
3. Sealant curing rate at 73 degrees F. and 50 percent relative humidity (RH).
    a. Tack-free time: 6 to 8 hours.
    b. Final cure time: 10 to 12 days.
4. Neoprene gaskets and tape type sealer shall not be used.
5. Sealant shall be flexible, conforming to FS-TT-S-00230, Type II, non-sag, I self-leveling. Class A; Sikaflex-1A, or equal.

G. Finish – Stainless Steel Tanks

1. Tank shell composition shall be of Type 304 stainless steel, ASTM-A-240, SME-sa-240, cold worked to build high yield strength.
2. Structural shapes and web trusses may be coated on exterior of tank only, ASTM-A-36 structural steel with hot dipped galvanized coating, to ASTM A123 and ASTM A153.

2.03 APPURTENANCES

A. Appurtenances shall be per AWWA D103 latest edition, Section 5.

B. Pipe Connections:

1. Where pipe connections are shown to pass through tank panels, they shall be field located, saw cut or shop cut at manufacturing site, (acetylene torch cutting or welding is not permitted). Tank shell reinforcing shall comply with AWWA D103 latest edition. A single component urethane sealer shall be applied on any cut panel edges or bolt connections.
2. Overflow piping shall be ___ inches in diameter and shall be adequately supported to prevent movement or damage to the overflow pipe when discharging water.
3. The overflow pipe/weir box tank wall penetration shall consist of a wall/weir box. The overflow pipe shall then be connected to the flanged overflow pipe nipple.

C. Outside Tank Ladder

1. An exterior tank ladder shall be attached to the tank shell extending from approximately 8 ft. above the top of foundation to the top of the shell.
2. Ladder rungs shall be not less than ¾ inch, round or square, spaced at 12 inch centers. The surface of the rungs shall be knurled, dimpled, or otherwise treated to minimize slipping. Ladders shall be secured to the tank by brackets located at intervals not exceeding 10 feet. Brackets shall be of sufficient length to provide a minimum distance of 7 inches from the center of the rung to the nearest permanent object behind the ladder.
3. Ladders shall be fabricated of galvanized steel or aluminum.



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4. Safety cage and step-off platforms shall be fabricated of galvanized steel.
5. Ladders shall be equipped with a hinged, lockable, entry device. (optional)

D. Openings

1. Roof Vent
   a. A properly sized vent assembly in accordance with AWWA D103 latest edition, shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum design rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5-inch water column.
   b. The overflow pipe shall not be considered to be a tank vent.
   c. The vent shall be constructed of aluminum or stainless steel such that the hood can be unbolted and used as a secondary roof access.
   d. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2 inch) opening. An insect screen of 23 to 25 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

2. Roof Access Manhole
   a. One roof access hatch shall be provided in accord with AWWA D103 latest edition.
   b. The roof access hatch shall be a minimum of 24" x 16" inches and allow access from the roof to the interior of the tank.
   c. The roof hatch shall be hinged and equipped with a hasp for locking.
   d. The roof hatch cover shall have a 2 inch downward edge.
   e. The opening shall have a minimum 4 inch curb.

3. Shell Access Manhole
   a. One bottom access door shall be provided in accordance with AWWA D103 latest edition.
   b. The manhole opening shall be a minimum of 24 inches in diameter. The access door (shell manhole) and the tank shell reinforcing shall comply with AWWA D103 latest edition.
   c. The shell manhole penetration shall be watertight when closed.

E. Identification Plate
1. A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity.
2. The nameplate shall be affixed to the tank exterior sidewall at a location approximately five (5) feet from grade elevation in a position of unobstructed view.

PART 3 – EXECUTION

3.01 – ERECTION

A. Foundation
1. The tank foundation is a part of this contract and shall be installed by the tank contractor.
2. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.
3. Tank footing design shall be based on the soil bearing capacity given in the geotechnical analysis performed by the licensed soils engineer.



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B. Tank Floor

1. Tank Floor (Concrete Option):
    a. The floor design shall be of reinforced concrete with an embedded stainless steel starter sheet per the manufacturer's design and in accordance with AWWA D103 latest edition.
    b. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one-sixteenth (1/16) inch within any ten (10) feet of length.
    c. A leveling plate assembly consisting of two anchor rods and a slotted plate shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks or bricks, using shims for adjustment, is no permitted.
    d. Place one butyl rubber elastomer water stop seal on the inside surface of the starter ring below concrete floor line. Place one bentonite impregnated water seal below the butyl rubber seal. The materials shall be installed in accordance with tank manufacturer's instructions.
    e. The floor and footing shall be constructed to the dimensions shown on the approved Shop Drawings.
    f. Prior to placement of the floor concrete, all piping that penetrates the floor shall be set and encased in concrete.

2. Tank Floor (Stainless Steel Option)
    a. The floor design shall be of stainless steel with a reinforced concrete wall and footing with an embedded anchor system to be bolted to the stainless steel starter ring and stainless steel floor as per the manufacturer's design and in accordance with AWWA D103 latest edition.
    b. The stainless steel floor, concrete wall and footing and compacted granular fill shall be constructed to the dimensions shown on the approved shop drawings.
    c. Prior to placement of the stainless steel floor, all piping that penetrates the floor shall be properly located before the floor is set.

C. Sidewall Structure
    1. Field erection of the stainless steel, bolted steel tank shall be in strict accordance with the procedures outlined in the manufacturer's erection manual, and performed by an authorized dealer of the tank manufacturer, regularly engaged in erection of these tanks, using factory trained erectors.
    2. No backfill shall be placed against the tank sidewall without prior written approval of the tank manufacturer. Any backfill allowed shall be placed according to the strict instructions of the tank manufacturer.

3.02 – CONCRETE

A. All concrete shall be conveyed, placed, finished, and cured as required by pertinent ACI standards.
B. Weather Limitations:

    1. Unless specifically authorized in writing by the Engineer, concrete shall not be placed without special protection during cold weather when the ambient temperature is below 35 degrees F. and when the concrete is likely to be subjected to freezing temperatures before initial set has occurred and the concrete strength has reached 500 psi. Concrete shall be protected in accordance with ACI 306. The temperature of the concrete shall be maintained in accordance with the requirements of ACI 301 and ACI 306. All methods and equipment for heating and for protecting concrete in place shall be subject to the approval of the Engineer.
    2. During hot weather, concreting shall be in accordance with the requirements of ACI 305.



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3. Placement of concrete during periods of low humidity (below 50 percent) shall be avoided when feasible and economically possible, particularly when large surface areas are to be finished. In any event, surfaces exposed to drying wind shall be covered with polyethylene sheets immediately after finishing, or flooded with water, or shall be water cured continuously from the time the concrete has taken initial set. Curing compounds may be used in conjunction with water curing, provided they are compatible with coatings that may later be applied, or they are degradable.

C. Finishes: The tank floor slab shall receive a bull float finish.
D. Curing: Concrete shall be cured using water methods, sealing materials, or curing compounds. Curing compounds used within the tank shall be suitable for use with potable water.

3.03 – FIELD TESTING

A. Hydrostatic
   1. Following completion of erection and cleaning of the water storage tank, the structure shall be tested for liquid tightness by filling tank to its overflow elevation.
   2. Any leaks disclosed by this test shall be corrected by the authorized dealer in accordance with the manufacturer's recommendations.

3.04 – DISINFECTION

A. Standards
   1. The tank structure shall be disinfected at the time of testing by chlorination in accordance with AWWA Standard C652-02 "Disinfection of Water Storage Facilities".
   2. Disinfection shall not take place until tank sealant is fully cured.
   3. Acceptable forms of chlorine for disinfection shall be:
      a. Liquid chlorine as specified in AWWA C652-02.
      b. Sodium hypochlorite as specified in AWWA C652-02.
   3. Acceptable methods of chlorination shall be:
      a. Chlorination method 1 as outlined in AWWA C652-02 Sec. 4.3.1.
      b. Chlorination method 2 as outlined in AWWA C652-02 Sec. 4.3.2.
      c. Chlorination method 3 as outlined in AWWA C652-02 Sec. 4.3.3.

3.05 – CLEAN-UP

A. The premises shall be kept clean and orderly at all times during the work. Upon completion of construction, the contractor shall remove or otherwise dispose of all rubbish and other materials caused by the construction operation. The Contractor shall leave the premises in as good a condition as it was found.

3.06 – TANK MANUFACTURER'S WARRANTY

A. Tank manufacturer's warranty shall be provided consistent with the requirements of the project specifications, contract documents, or particular requirements or needs of the Owner. The terms and conditions of the tank manufacturer's warranty are unique to each project and are subject to negotiation.



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## Sample Tank Plans

The tank plans on the following pages are an example of the services provided by our design department. Each tank is individually designed to specifications and thorough plans are provided by the customer.

**Where:** Sharon, PA
**Type of Tank:** (2)-Sludge Storage Tanks
**Sizes:** 89.23' x 27'
**Capacity:** 1,256,494 Gallons, Each
**Customer:** City of Sharon, PA
**Type of Floor:** Concrete
**Type of Roof:** Aluminum Geodesic Dome

# ASI TANK INCORPORATED

www.asitank.com
asi@asitank.com
715-233-1815
Fax: 715-233-1819

**CUSTOM TANK & SILO ERECTION**

## Tank Construction

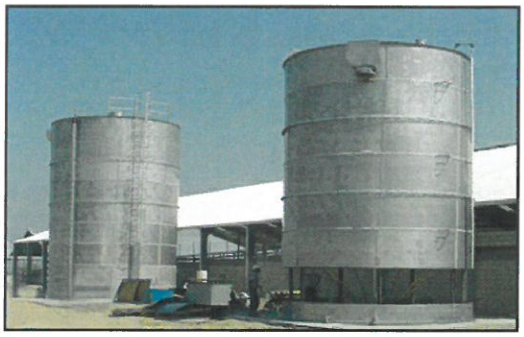
ASI Tank's erection crews have extensive training and experience in construction of all types of storage tanks in a variety of climates. Whether bolted in the field or factory welded, ASI Tank can erect storage tanks in tight places and all environments. They provide the tools and equipment necessary for erection, cleaning and testing of the structure after completion.

### ASI Tank Offers:

- Field bolted storage tank erection
- Shop welded storage tank erection
- Aluminum dome construction and installation
- Tear down, refurbishing and relocating
- All inclusive service quotes
- Foundation preparation
- Concrete work
- Full time, year-round erection crews
- Pre-owned tank erection
- Experience in epoxy coated, stainless steel and glass lined tanks and silos

### Special Services:

ASI Tank offers tank repair and removal service as well as sales of refurbished pre-owned tanks and silos. They are experts on making modifications or repairs to existing tanks, as well as removing or relocating pre-owned structures. Existing tanks are disassembled and reassembled with new gaskets and hardware. This process provides a cost effective alternative to new tanks and prolongs the life span of the structure.



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# Tanks and Silos, LLC

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www.cetanksandsilos.com
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1-888-311-TANK

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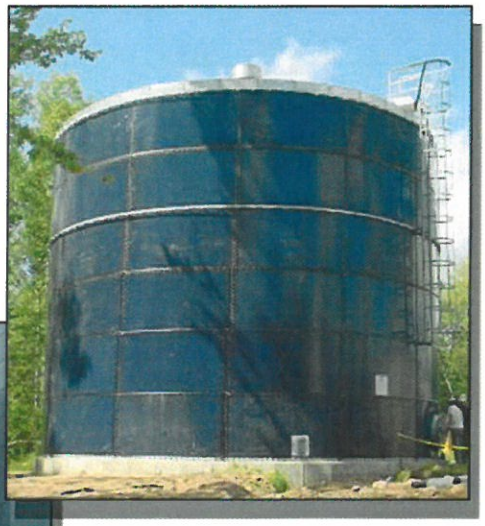

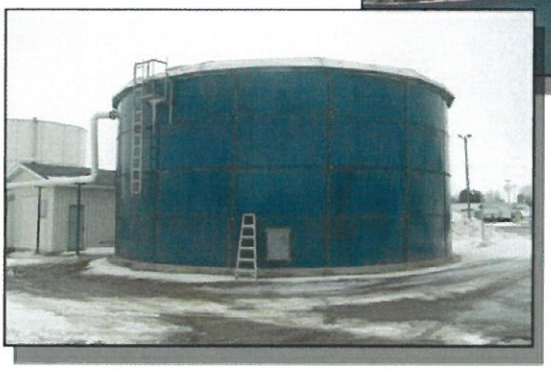

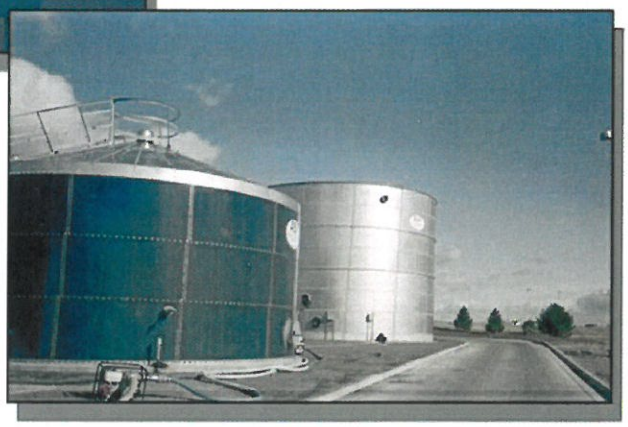

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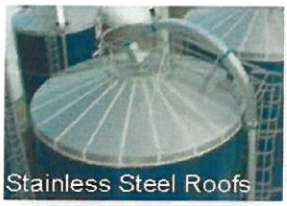



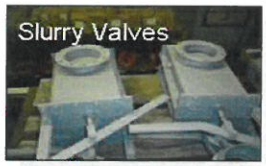


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- New Stainless Steel Bolted Tanks
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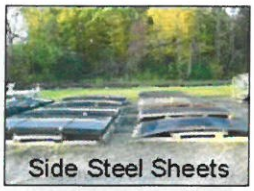



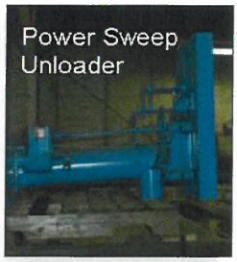




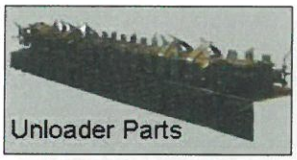










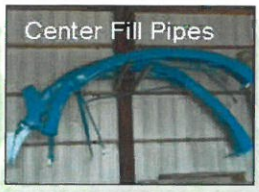


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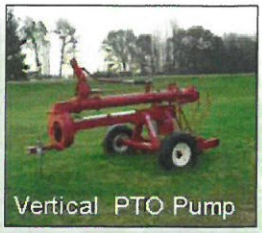

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# MEMO

***To:*** Garfield Township Board of Trustees

***Re:*** US 31 Sewer Monitoring / SAW Grant

***From:*** Jennifer Hodges, GFA

***Date:*** April 18, 2017

The Stormwater, Asset Management and Wastewater Program (SAW) was implemented in 2013 and provided grant and loan programs to assist municipalities in establishing asset management planning practices and to improve water quality and/or deficiencies pertaining to existing sanitary and/or stormwater systems.

The grants were awarded on a first-come, first-served basis and the Township submitted an application and was successfully awarded a grant in the amount of $90,540 in 2016 with the condition the Township was to match $10,060. **The primary condition for distribution of these grant dollars is that they are to be utilized with deliverable products and/or construction within 3 years. Otherwise the money must be returned to the State of Michigan.**

The details and scope of services scope of services that the grant money was submitted to be used for and approved for as follows:

**A. Pump Station #3 Rehabilitation**

Pump Station #3 has been upgraded work was completed / project turned over late this last year. SAW grant funds were appropriated as follows:

***Total Approved Cost for Planning and Engineering Design / Permit Services = $15,200 (Township match = $1,500 / Grant Reimbursement of $13,700)***

*Full Request Amount was submitted to DEQ for Reimbursement in January 2017

**B. Asset Management Plan**

In 2005 Garfield Township received a MDEQ S2 Grant to conduct a complete capacity and Inflow /Infiltration Analysis on their entire sewer system as completed by GFA. This project allowed us to conduct flow monitoring, create a working hydraulic model, inventory infrastructure and identify existing and future areas with sewer mainline capacity restrictions. A State Revolving Loan was then pursued with 40% American Reinvestment and Recovery Act (ARRA) relief provided to design and construct improvements that were found to exist along Garfield Road. Unlike the water system where water reliability studies are required to

be completed every 5 years, there is no current requirement for sewer. Through the years, GFA continues to monitor the capacities of the Garfield Township sewer system as new users connect using the hydraulic model as a tool. As this information is over 10 years old and in need of update, the majority of the SAW grant money requested was to complete a more thorough Asset Management Plan (AMP). An asset management plan is defined as the active practice of managing a physical asset to achieve maximum benefit while providing the desired level of service.

The details and status for each component of work related to the AMP are defined below as was presented and approved with the SAW Grant. The intent was a collaborative effort between GFA Staff and Garfield Township Staff.

A. Asset Inventory

***1)*** Performing Sanitary Sewer monitoring at key locations in Garfield Township driven by recent growth (by GFA). ***Currently the only location identified is the sewer along US-31 near Meijer (siphon) and is nearing capacity with recent development growth such as Lonetree, Brookside, pending Herkner parcel development, etc.***

2) Updating SewerCad Model to reflect current as-builts and flow monitoring data (by GFA)

***3)*** Converting As-built and SewerCAD data to GIS compatible files for import into existing Township Arcview maps to create overall defined sewer system map (by GFA). ***This has been ongoing and being conducted on behalf of the Township through the Board of Public Works.***

***4)*** GPS data collection of all sanitary sewer manholes, includes purchase of GPS equipment and training (by Township Staff) . ***This is currently being proposed to the BPW to be completed by BPW staff***

5) Purchase of current version of Arcview with more features including training (by Township Staff)

6) Transfer of GPS data to GIS map to create spatially accurate sanitary sewer map (by Township Staff)

B. Level of Service / Critical Assets (by GFA)

GFA would conduct current assessment and reports of all critical assets, e.g pump stations. This will include establishing current condition, depreciated value, replacement cost, rating of failure, and Business Risk factor. ***This is currently being proposed to the BPW to be completed by BPW staff***

C. Capitol Improvements Plan (by GFA)

Completion of a prioritized capitol improvements plan based upon information obtained from the previous work. This will include OPCC for proposed work. ***A report would be prepared outlining findings from sewer flow monitoring and capacity analysis including improvement evaluation including costs and benefits.***

D. O&M Strategies / Rate Evaluation (by GFA)

This shall entail completing an assessment of the user rates and replacement fund and will include reviewing existing and proposed expenditures (O&M, capitol improvements) in comparison to available replacement funds and rate charges. Estimated replacement fund budgets to be prepared

for future years along with rate calculations demonstrating sufficient revenues to cover existing and proposed costs.

***Total Approved Cost for the AMP is $85,000 maximum ($8,500 Township Match / $76,500 Grant Reimbursement)***

*None has been requested for reimbursement to date.

There has been recent growth in the northwestern portion of the Township that has warranted the need for water system improvements. The same growth is impacting the available capacity of the sanitary sewer system. The sanitary sewer that captures all the flow on this side of town is discharged along an existing trunkline along US-31 that crosses Kids Creek via a siphon near Meijer and then discharges into the City's sewer system. The segment immediately upstream of the siphon has been increasingly clogging and operating near capacity as documented by GFA and the DPW for the past couple years. There is now interest from the developers of the Herkner parcel to connect to the Townships sewer system (whom would discharge into this same trunkline). It is requested that flow monitoring and accompanying report identifying capitol improvements be prepared to address. This work is consistent with some of the items requested of the SAW Grant (Specifically A.1 and C) and would be requested as a reimbursement upon completion of work. The following work is proposed and associated budgeted cost:

1. Flow monitoring of 15-inch sanitary sewer upstream of siphon for a period of 6 weeks in spring. To account for wet weather and potential I&I. Meter is to be provided by GFA along with staff time to install, monitor and collect data
2. Evaluation of flow data to determine actual peak and average flow for service area. Evaluate impacts to system and update hydraulic model with actual flow data including available remaining capacity
3. Establish a capitol improvement plan including 2 to 3 options and associated benefits and costs.
4. Prepare information in a report for presentation to board.

Equipment Rental / Field Research / Field Personal Time = $8,500
Flow Evaluation, Model Update, Option Analysis, CIP and Report = $3,500
Total Cost = $12,000

GFA appreciates the opportunity to be involved with this work and continuing to look out for the interests of Garfield Township.

# Charter Township of Garfield
## Planning Department Report No. 2017 - 31

| | | | |
|---|---|---|---|
| Prepared: | April 18, 2017 | Pages: | Page 1 of 1 |
| Meeting: | May, 9 2017 Township Board | Attachments: | ☒ |
| Subject: | BVNP - Construction Oversight | | |

**BACKGROUND:**

**2015**

1. The Township sought and received a MNRTF grant in 2015 for improvements to the Boardman Valley Nature Preserve. As a reminder, the grant will help to pay for the construction of a universally accessible kayak/canoe launch, vehicle parking area and turnaround, pavilion, vault toilets, and reconstruction of the pickleball courts.
2. A Rotary Charities grant was awarded in the amount of $37,500 to be used towards the Pickelball courts.

**2016**

1. On October 4, 2016, the Parks and Recreation Commission recommended that the Prein & Newhof bid in the amount of $26,000.00 Not To Exceed (and not including review fees and bidding services) be selected, to be taken out of the park fund.
2. On October 11, 2016 the Township Board awarded the bid for engineering services for the Boardman Valley Nature Preserve Improvements to Prein & Newhof.
3. An extension of one year was granted by Rotary Charities on the grant funds of $37,500.

**2017**

1. On approximately April 10, 2017, Prein & Newhof completed the contract for design and engineering services.
2. On April 11, 2017, the Board authorized Prein & Newhof a contract for $1800.00 to complete bid documents, attend the bid opening, conduct phone interviews, address contractor questions etc.
3. April/ May demolition and commence construction.
4. May/June Construction to be completed.

Please note; The Rotary Charities grant of $37,500 must be used by *June 30, 2017* or we face losing the funding.

**STAFF COMMENT**

Before you tonight (attached) is a contract for consideration to have Prein & Newhof oversee the construction of the project. Due to their involvement with the project and the less than ideal timeframe regarding the expiration of the Rotary grant, Staff is requesting that the contract be strongly considered.

**ACTION REQUESTED:**

MOTION THAT the contract provided by Prein & Newhof for Construction Observation Services in the amount of $12,150 be accepted and taken from the Parks and Recreation budget.

Prein&Newhof
Engineers ▪ Surveyors ▪ Environmental ▪ Laboratory

April 17, 2017

Mr. Roberto Larrea
Director of Planning
Garfield Charter Township
3848 Veterans Drive
Traverse City, MI 49684

RE: Proposal for Construction Observation Services
Boardman Valley Nature Preserve Site Improvements

Dear Mr. Larrea:

Thank you for your recent request to receive a proposal for "Construction Observation Services". Having a seamless transition from design to bidding to construction is something that we feel is very important. Please see below for our scope of proposed services.

- Shop Drawing Review
- Construction Observation (5site visits)
- Progress Payment Review
- Construction Staking (value $3300 per our original proposal)
- Punch List and Project Close-Out Documents
- Construction Testing (sand & gravel compaction)

Hourly Not to Exceed - $12,150

Should you have any questions about our proposal please do not hesitate to call us. If the proposal is agreeable we can send you an amendment to our existing professional services agreement. Thank you again for the opportunity to serve Garfield Charter Township.

Sincerely,

**Prein&Newhof**

Matthew G. Levandoski, ASLA, PLA
*Landscape Architect*

Kenneth Bosma, P.E.
*Team Leader*

MGL/mgl
Enclosure(s): None