



Regular Meeting of the Planning Commission

Tuesday, March 14, 2017

7 pm Regular Meeting

1307 Cloquet Ave, Cloquet, MN 55720

AGENDA

1. Call to Order
2. Roll Call
3. Additions/Changes to the Agenda
4. Minutes from the February 14, 2017 Planning Commission meeting
5. Zoning Case 17-03: Marvin Development IV, LLC, Variances and Site Plan
6. Zoning Ordinance Amendments – Breweries, Taprooms, Brew Pubs, Micro Distilleries - Discussion
7. Zoning Ordinance Amendment - Crematories
8. Commissioner's Questions/Comments
9. Adjourn

NEXT MEETING:
April 11th @ 7 pm



Regular Meeting of the Planning Commission

Tuesday, February 14, 2017

7:00 p.m.

1307 Cloquet Ave, Cloquet, MN 55720

OATH OF OFFICE

Al Cottingham administered the Oath of Office to Nathaniel Wilkinson and Terri Lyytinen.

CALL TO ORDER

Chairman Wilkinson called the meeting to order at 7:00 p.m.

ROLL CALL

Attending: Planning Commission members: Jesse Berglund, John Sanders, Kelly Johnson, Terri Lyytinen, Nathaniel Wilkinson and Uriah Wilkinson; City: Al Cottingham.

Absent: Commission members: Bryan Bosto.

Others Present: Don Proulx and Steve Johnson.

ADDITIONS/CHANGES TO THE AGENDA

None.

AGENDA ITEMS

January 10, 2014 Meeting Minutes

Chairperson Wilkinson asked for any corrections or additions.

Motion: Commissioner Johnson made a motion to approve the Planning Commission meeting minutes from January 10, 2017, Commissioner Berglund seconded. (Motion was approved 6-0).

Zoning Case 17-01: Variance for Otter Creek Properties, LLC

Chairman Wilkinson reviewed the public hearing procedures and format and opened the public hearing for Zoning Case 17-01, Variance for Otter Creek Properties, LLC. He asked Mr. Cottingham to provide an overview of the topic. Mr. Cottingham noted Otter Creek Properties, LLC is proposing a variance to the Subdivision Code that requires a second road access before the City would take over the roads. The Preliminary Plat was approved on March 2, 2004 with this requirement as one of the conditions. The Final Plat was approved on May 18, 2004 and this requirement was not listed as one of the conditions. The City Attorney has reviewed this and given an opinion that since this condition was not in the final plat then the roads and their maintenance is an obligation which should be taken over by the City without a second access being constructed.



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Don Proulx, Otter Creek Properties, LLC noted they had made a similar application in 2009 that didn't go anywhere. They have been maintaining the roads since they were constructed in 2006. There are some major wetlands to the east of the development that would need to be filled in order to construct a second access to Moorhead Road. Another option would be to construct a road to the north crossing Otter Creek, a designated trout stream, and tie into Spring Lake Road. He noted that both of these options would be very costly if they would even be approved by other agencies.

Chairman Wilkinson asked if anyone else wished to speak and since nobody wished to he closed the public hearing.

The Commission discussed the condition of the roads, driveway accesses and the safety with sight distances.

Motion: Commissioner Sanders made a motion to approve Resolution No. 17-01 A Resolution Recommending Approval of a Variance to the Subdivision Code Requiring Two Access Points for a Subdivision in the SR – Suburban Residential District for Otter Creek Properties, LLC, Commissioner Johnson seconded. (Motion was approved 6-0)

Cottingham noted that this item would be forwarded to the City Council for their meeting on Tuesday, February 21st.

Zoning Ordinance Amendments – Breweries, Taprooms, Brew Pubs and Micro Distilleries

Mr. Cottingham stated the City Council had recently amended the city code to include Breweries, Taprooms, Brew Pubs and Micro-Distilleries. With these amendments there will need to be changes made to the Zoning Ordinance as to where these types of facilities are allowed. Staff had discussed the Historic Downtown, City Center, Light Industry and the Office/Manufacturing Districts. They thought the Office/Manufacturing District would only allow for a brewery and micro-distillery with no on site consumption at this time. He was looking for some discussion and comments from the Commission on this.

The Commission felt that since we are trying to get businesses into the business park we should allow taprooms with a brewery if they chose to locate there. They would also like to have examples from other communities to see how they are handling these. They also wanted copies of the state statute regarding these.

Cottingham noted he would put together this information and bring it back to the Commission at their March meeting.



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Meeting Etiquette

Chairman Wilkinson introduced this item in light of the last meeting and how some things were handled. He felt with two new members that this was a good time to review this for everyone and how we should conduct ourselves.

Cottingham noted that while we all have our passions for things we do not all agree on things. That is alright but we need to remember to respect each other and the views that we have even though we may not agree with them. He noted that we all needed to be courteous to one and another and to the audience and their comments and concerns. He noted that he had included a copy of the a-b-c's of Parliamentary Procedure for everyone to review. In general we follow that procedure in a loose format so it acts as a guide to follow. There are times when the chair may need to get the attention of members of the commission or the audience and the use of the gavel may be appropriate to do so.

He reminded the Commission of the open meeting law requirements and to watch the line of discussions if more than three members happen to be together at some type of gathering.

Commissioner's Questions/Comment

Cottingham noted that the application for SKB/Shamrock Landfill would be going to the City Council on March 7th.

Cottingham inquired if the Commission would be receptive in an ordinance amendment to allow crematories in other Zoning Districts and not just the HI – Heavy Industry District. The consensus was that they would be but would like to see where they are located in other communities.

Next Meeting

March 14, 2017

Meeting adjourned 7:52 p.m.

Respectfully submitted,

Al Cottingham, City Planner/Zoning Administrator



Community Development Department

1307 Cloquet Avenue • Cloquet MN 55720
Phone: 218-879-2507 • Fax: 218-879-6555

To: Planning Commission
From: Al Cottingham, City Planner/Zoning Administrator
Date: March 8, 2017

ITEM DESCRIPTION: ZONING CASE 17-03: VARIANCES AND SITE PLAN FOR MARVIN DEVELOPMENT IV, LLC (TACO BELL) 1418 HIGHWAY 33 SOUTH

Background

Marvin Development IV, LLC has submitted a Variance and Site Plan application for Taco Bell. The site is located at 1418 Highway 33 South.

The Variances are to the maximum size of a menu board, the minimum building width and the front yard setback to Tall Pine Lane.

The Site Plan is for Taco Bell with associated parking, landscaping, grading and drainage and building location.

A public hearing will be held on Tuesday, March 14, 2017 to consider the Variances. A legal notice was published in the Pine Journal on March 2, 2017 and property owners within 350 feet were sent notice of the public hearing.

Variance

Section 17.5.13, Subd. 8 A (10), Menu boards subject to the following conditions: a. A maximum of two menu boards per drive thru lane shall be permitted on a parcel of land with a restaurant providing drive –up window service. b. The menu board shall be a maximum of thirty (30) square feet in area and may be in addition to any other signs permitted by this chapter. c. The menu board shall be single-sided and oriented in such a manner so that the signs provide information to the patrons using the drive-through facility only, and do not provide supplemental advertising to pass-by traffic. d. The menu board signage shall be completely enclosed within one sign area. e. Order confirmation signage no greater than one square foot and incorporated into the drive-through speaker pedestal shall not be calculated as part of the menu board signage. Order confirmation signage greater than one square foot shall be incorporated into menu board and calculated as part of said board’s sign area. The proposed menu board is 44.5 square feet in size versus the maximum 30 square feet allowed.

Section 17.5.15, Subd 4 B, Minimum Street Frontage Build-Out. (That portion of the primary street frontage which must have a majority of the primary structure touching the setback line): (2) Remainder of Highway 33 Corridor – thirty percent (30%), Exception: Development proposals which cannot meet the above build-out standard will require special review by the



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Planning Commission to assure that compliance with the goals of this Section and the Community Revitalization Master Plan of 1998 will be achieved. The proposed building width measures 34.6 feet facing the frontage road. The resulting build-out would be 20.4 % of the lot width.

Section 17.6.11, Subd. 5 B (2), Minimum principal building setback from corner street side parcel line. Other streets: Thirty-five (35) feet. The proposed building setback is 21.9 feet from Tall Pine Lane.

The petitioner has addressed each of these variances in the attached narrative.

Site Plan

Attached, the Commission will find the following plans for this development:

- Site Plan
- Grading and Drainage Plan
- Utility Plan
- Landscape Plan
- Lighting Plan
- Building Elevations

Stormwater Management: (Section 18.6)

The developer has also run a hydraulic model for storm water which has been reviewed by the City Engineer, comments attached, and meets requirements. There is an existing storm water pipe in the northeast corner of the site that will be connected to for the drainage of the site.

The Code requires private stormwater areas to meet the following requirements:

1. A permanent public easement shall be provided to the city for access for inspection and/or maintenance purposes. Cost incurred by the city for any maintenance of private systems will be billed and/or assessed to the owner/operator.
2. Recorded inspection and maintenance agreements that define inspection and maintenance responsibilities are required. A minimum annual inspection for private systems shall be required. These requirements are transferrable to any party that becomes the owner/operator of the site.
3. An inspection and maintenance plan shall be developed, approved and included as an attachment to the maintenance agreement. At a minimum, maintenance plans must include the following:
 - a. Responsible person(s) for completing inspections and conducting maintenance.
 - b. Frequency of inspections and maintenance.
 - c. Inspection checklist and type of maintenance anticipated.
4. If site configurations or structural stormwater BMPs change, causing decreased BMP effectiveness, new or improved structural stormwater BMPs must be implemented to meet the requirements of this section.



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5. The property owner shall keep on file all structural stormwater BMP annual inspection and maintenance records for 5 years and submit to the City as requested.
6. The City shall require the submittal of a letter of credit or other financial security in a form acceptable to the city in the amount of \$5,000 to ensure the stormwater treatment systems are installed correctly and in accordance with this ordinance.

Since this ponding area will also be collecting water from Holmes Drive the City will be maintaining the stormwater treatment system.

Impervious Surface: (Section 17.6.11, Subd. 5. E and F)

The zoning district allows the maximum building coverage to be 60% with a maximum impervious surface coverage of 70%. The impervious surface coverage is approximately 53% which is below what is allowed for the building by itself.

Building Setbacks: (Section 17.6.11, Subd. 5. B)

The ordinance requires that the minimum front setback be 35 feet, the minimum side yard setback be 20 feet and the minimum rear yard setback be 30 feet. It has been determined that the site has two front yards, a side yard and a rear yard. With the exception of the front yard setback to Tall Pine Lane the setbacks to the other property lines are met.

Landscaping: (Section 17.5.04 Subd. 5.)

The landscape plan shows 18 overstory plantings, the site is required to have 18 overstory plantings in addition to understory trees and shrubs. The plan shows that with the exception of the stormwater areas the site will be irrigated.

Parking: (Section 17.5.11 Subd. 6.)

The site is required to have 36 parking spaces based on 1 parking stall per 40 square feet of seating area plus 1 per 80 square feet of kitchen area. The site plan shows 36 parking spaces.

Trash Storage: (Section 17.5.15 Subd. 7. A (7))

The trash storage area can either be inside the building or an exterior enclosure. The trash storage area will be inside the building.

Signage: (Section 17.5.13 Subd. 14.)

The plan shows a pylon sign, wall signage and a menu board. The proposed pylon sign and wall signs are below the maximum allowed. A variance is being sought for the size of the menu board sign.

Lighting: (Section 17.5.12 Subd. 5. B)

The applicant has provided a photometric plan along with detail sheets which display downward facing fixtures that emit footcandle readings that are compliant with City lighting standards.



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Other Site Plan Items:

Pedestrian access to the site will be via a new sidewalk extending south from Tall Pine Lane the distance of the site and an extension to the building from that sidewalk. They are also showing a bike rack on the site.

Policy Objectives

The Zoning Ordinance states Variances may be granted when they are in harmony with the general purpose and intent of the ordinance, are consistent with the Comprehensive Plan, and when the applicant for the variances establishes that there are practical difficulties in complying with the official control. No variance may be granted unless **all** of the following conditions exist:

1. The property owner proposes to use the property in a reasonable manner not permitted by an official control;
2. The plight of the landowner is due to circumstances unique to the property not created by the landowner; and
3. The variance, if granted, will not alter the essential character of the locality.

The purpose of this Site Plan Review application is to ensure that this development project is aligned with city development standards.

Financial Impacts

The Variance and Site Plan fees were paid.

Advisory Committee Action Requested

The Planning Commission should listen to the testimony that is presented at the public hearing pertaining to the variances. Following this review the Planning Commission can approve the request, deny the request or table the request for some additional information.

The Commission should also review the Site Plan and take into account any comments pertaining to it. Following this review the Planning Commission can recommend approval of the request, recommend denial of the request or table the request for some additional information.

Staff Recommendation

Staff would recommend approval of the Variances to the maximum size of a menu board, the minimum building width and the front yard setback to Tall Pine Lane. Staff has checked the size of the menu boards at three other fast food restaurants and found them to range between 38.5 and 44.4 square feet. The variance for the width of the building and the setback to Tall Pine Lane somewhat go together. The storm water ponding area on the south side of the site is helping the city with a drainage issue on Holmes Drive in this area, if the building was wider and pushed to the south to meet the required setback to Tall Pine Land then the storm pond would not be able to be designed to meet the needs of both the city and the property owner. Staff would recommend approval of the Site Plan subject to at least the conditions in the attached resolution.



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Supporting Documents Attachments

- Resolution No. 17-03 Variance
- Resolution No. 17-03 Site Plan
- Location Map
- Variance Narrative
- Engineer's Memo
- Site Plan Maps

STATE OF MINNESOTA

COUNTY OF CARLTON

CITY OF CLOQUET

Commissioner _____ offered the following Resolution and moved its adoption.

RESOLUTION NO. 17-03 VARIANCE

A RESOLUTION APPROVING THREE VARIANCES; TO THE MAXIMUM SIZE OF A MENU BOARD; THE MINIMUM BUILDING WIDTH; AND, THE FRONT YARD SETBACK IN THE RC – REGIONAL COMERCIAL DISTRICT FOR MARVIN DEVELOPMENT IV, LLC

WHEREAS, Marvin Development IV, LLC is proposing three Variances; to the maximum size of a menu board; the minimum building width; and, the front yard setback in the RC – Regional Commercial District; and

WHEREAS, As required by ordinance, notification was advertised in the Pine Journal and property owners within 350 feet have been notified. A public hearing was held to consider the application at the regular meeting of the Cloquet Planning Commission on March 14, 2017 at which time Zoning Case / Development Review No. 17-03 was heard and discussed; and

WHEREAS, the property of the proposed Variances is located at 1418 Highway 33 South and is legally described as follows:

All that part of the Southwest ¼ of the Northeast ¼, Section 26, Township 49, North of Range 17, West of the Fourth Principal Meridian, Carlton County, Minnesota described as follows: Commencing at the Northeast corner of said Southwest ¼ of the Northeast ¼, thence running South on the East line of said quarter a distance of 350 feet; thence running Westerly at right angles with said East line of said quarter to the Easterly right-of-way line of said Highway 33 a distance of 200 feet to the point of beginning; thence deflecting to the left at an angle of 90 degrees and running Easterly a distance of 300 feet to a point; thence running in a Southerly direction on a line parallel with the East line of said quarter a distance of 200 feet to a point; thence running Westerly a distance of 300 feet, more or less, to a point 200 feet South of the point of beginning located on the East right-of-way line of Highway 33; thence running Northerly along the East right-of-way line of Highway 33 a distance of 200 feet to the point of beginning. And,

WHEREAS, the Planning Commission reviewed the staff report and approves the three Variances; to the maximum size of a menu board; the minimum building width; and, the front yard setback in the RC – Regional Commercial District.

NOW, THEREFORE, BE IT RESOLVED, BY THE PLANNING COMMISSION OF THE CITY OF CLOQUET, MINNESOTA, that the Planning Commission approves Zoning Case 17-03 for three variances; to the maximum size of a menu board; the minimum building width; and, the front yard setback in the RC – Regional Commercial District.

The foregoing motion was duly seconded by Commissioner _____ and being put to vote members voted: AYE: _____ NAY: _____ ABSENT: _____

JESSE BERGLUND	_____	BRYAN BOSTO	_____
KELLY JOHNSON	_____	TERRI LYYTINEN	_____
JOHN SANDERS	_____	NATHANIEL WILKINSON	_____
URIAH WILKINSON	_____		

Passed and adopted this 14th day of March 2017.

CITY OF CLOQUET

URIAH WILKINSON
CHAIR

ATTEST: _____
Alan Cottingham
City Planner/Zoning Administrator

STATE OF MINNESOTA

COUNTY OF CARLTON

CITY OF CLOQUET

Commissioner _____ offered the following Resolution and moved its adoption.

RESOLUTION NO. 17-03 Site Plan

**A RESOLUTION RECOMMENDING APPROVAL OF A SITE PLAN IN THE RC –
REGIONAL COMMERCIAL DISTRICT FOR MARVIN DEVELOPMENT IV, LLC
FOR TACO BELL**

WHEREAS, Marvin Development IV, LLC is proposing a Site Plan in the RC – Regional Commercial District for Taco Bell; and

WHEREAS, the property of the proposed Site Plan is located 1418 Highway 33 South and is legally described as follows:

All that part of the Southwest ¼ of the Northeast ¼, Section 26, Township 49, North of Range 17, West of the Fourth Principal Meridian, Carlton County, Minnesota described as follows: Commencing at the Northeast corner of said Southwest ¼ of the Northeast ¼, thence running South on the East line of said quarter a distance of 350 feet; thence running Westerly at right angles with said East line of said quarter to the Easterly right-of-way line of said Highway 33 a distance of 200 feet to the point of beginning; thence deflecting to the left at an angle of 90 degrees and running Easterly a distance of 300 feet to a point; thence running in a Southerly direction on a line parallel with the East line of said quarter a distance of 200 feet to a point; thence running Westerly a distance of 300 feet, more or less, to a point 200 feet South of the point of beginning located on the East right-of-way line of Highway 33; thence running Northerly along the East right-of-way line of Highway 33 a distance of 200 feet to the point of beginning. And,

WHEREAS, the Planning Commission reviewed the staff report and recommends approval of the Site Plan.

NOW, THEREFORE, BE IT RESOLVED, BY THE PLANNING COMMISSION OF THE CITY OF CLOQUET, MINNESOTA, that the Planning Commission recommends approval of Zoning Case 17-03 for a site plan for Marvin Development IV, LLC for Taco Bell subject to the following conditions:

1. The required easements, inspection and maintenance agreements, inspection and maintenance plan, financial guarantee and other items as required for the stormwater BMPs must be submitted before a building permit is issued
2. Compliance with the Assistant City Engineer's Memo.

The foregoing motion was duly seconded by Commissioner Johnson and being put to vote members voted: AYE: _____ NAY: _____ ABSENT: _____

JESSE BERGLUND	_____	BRYAN BOSTO	_____
KELLY JOHNSON	_____	TERRI LYYTINEN	_____
JOHN SANDERS	_____	NATHANIEL WILKINSON	_____
URIAH WILKINSON	_____		

Passed and adopted this 14th day of March 2017.

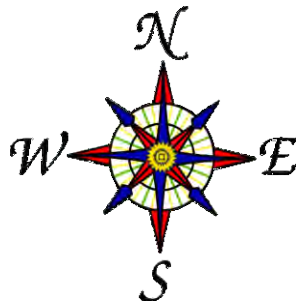
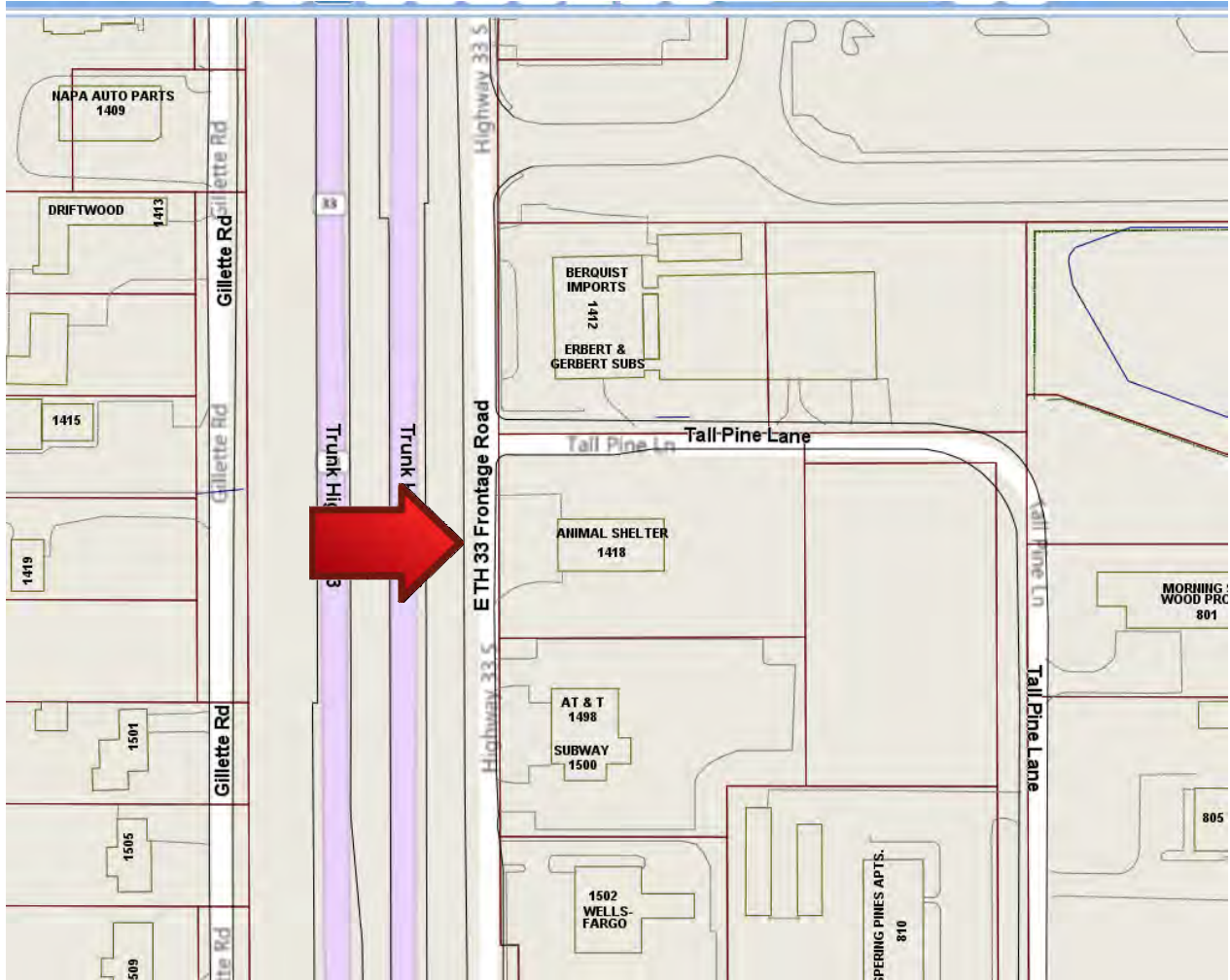
CITY OF CLOQUET

 URIAH WILKINSON
 CHAIR

ATTEST: _____
 Alan Cottingham
 City Planner/Zoning Administrator

Location Map

Marvin Development IV, LLC



No Scale

MARVIN DEVELOPMENT IV, LLC

5425 Boone Ave. North
New Hope, MN 55428
Direct Telephone: 763-489-2970
Direct Fax: 763-489-2971

February 16, 2017

City of Cloquet
1307 Cloquet Ave.
Cloquet, MN 55720

To the City Council Members, Planning Commissioners and Staff:

Border Foods, Inc. (Tenant) has been interested to bring brand Taco Bell to Cloquet for several years. We have pursued various locations but heretofore were unable to secure a location that was acceptable for a variety of reasons. Numerous times we were frustrated and disappointed at our inability to find a location. But we kept trying.

City staff is a reflection of city leadership. Throughout our multi-year quest, your city staff was always generous and prompt with their time and accessibility to answer our questions about zoning, engineering and design for multiple times and multiple sites. We've seen a variety of city staffs over the years and can say that your staff is among the best we've ever worked with and they represent your city well.

Border Foods is proposing a building that is relatively new to Taco Bell. Marvin Development has constructed this building in three locations last year. There are some different features that provide interest and differentiation. Our site plan incorporates Cloquet's code requirements and has some best management practices for storm detention. Marvin Development is proposing a quality project and hope that you think so too.

As with any location, there are codes or design standards that must be met. Our development was unable to meet two of these-size of the menu board and building width. Attached is our rational for the variance requests which are both critical elements of the project. We respectfully ask for your approval of our project and the variance requests.

Sincerely,



Barbara Schneider
VP Development

Marvin Development IV, LLC – Taco Bell

Narrative for Variance Request for Order Board Size

Our menu board exceeds the maximum allowable size by 14.5 square feet. This is an informational board which provides a legible copy of our full menu offerings to our drive thru guests. By showing the full complement of menu options, the board reduces the order time which is critical to a positive customer experience.

As our drive thru accommodates a majority of our guests who visit Taco Bell, we want to provide the same experience of that of the dine in guests.

Additionally, we have a visual, free standing order confirmation board in the drive thru. This board allows the drive thru guest to visually see the order that has been placed along with pricing. This board measures 15 inches. This order confirmation board allows guests to confirm or change their order as necessary and assists the operators with order accuracy.

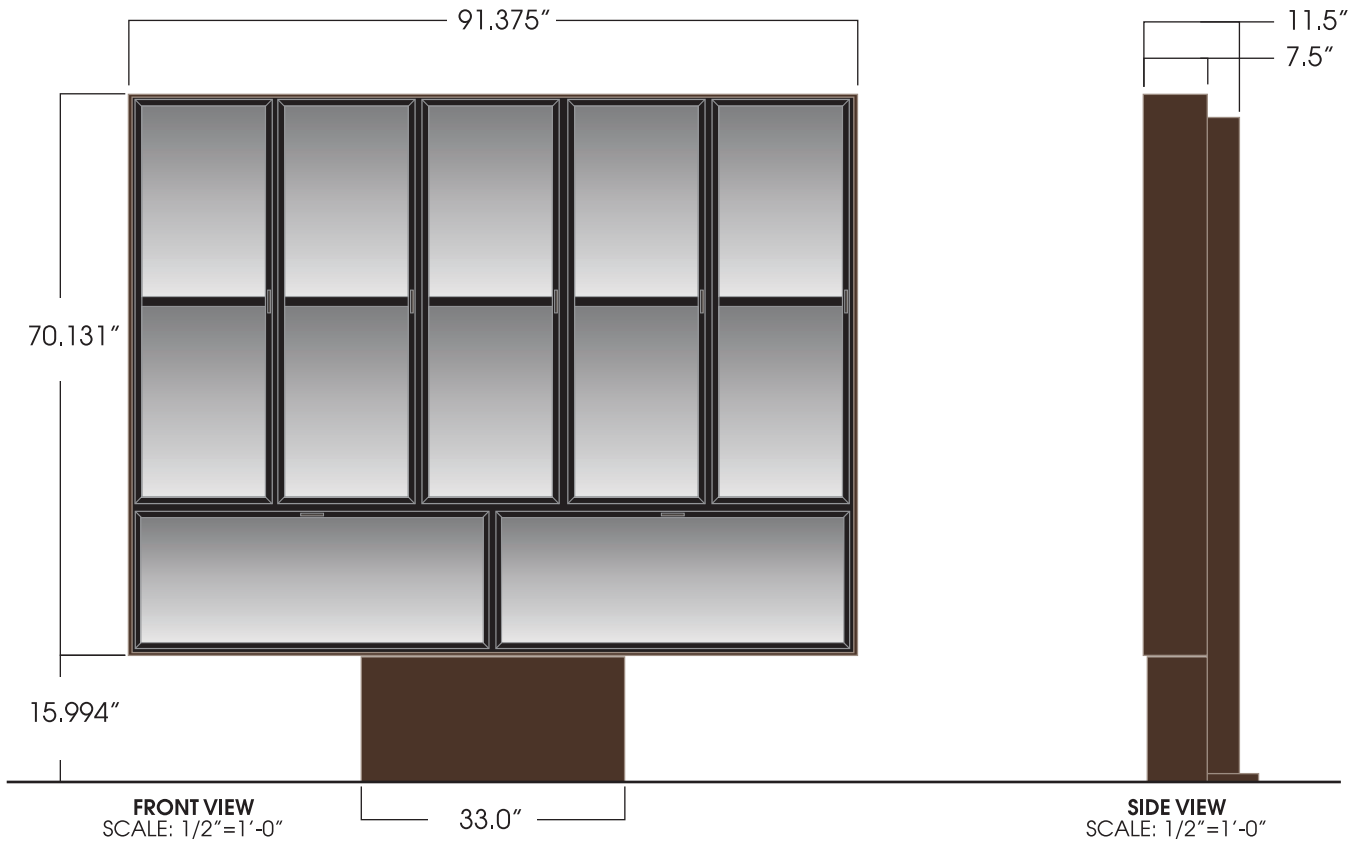
Narrative for Variance Request for Building Width of less than 30% on primary street frontage

Design Standards for the Highway 33 Corridor section 17.5.15.Subd4.B indicates Minimum Street Frontage Buildout requirement of 30% that would apply to this lot. The existing lot width measured along the Hwy 33 Frontage Road right-of-way is 170 feet (does not include Tall Pine Lane r/w). The calculated minimum buildout is then 51 feet per code as written.

The proposed building width measures 34.6 feet facing the frontage road. The resulting buildout would be 20.4% of the lot width.

Our building width is 9.6% below the required width of 30%. This 9.6% would require expanding the building width by 17 feet. Our economic model is based on a building size that accommodates our operating system and placement of equipment for efficiency. The equipment incorporated into the building is very specialized for processing and preparation of our products. The efficiency of our buildings and equipment is key to allowing the brand to develop and be successful in smaller markets.

The design of a Taco Bell that increased building width by 17 feet would essentially destroy the brand elements which are required by our franchisor. Taco Bell franchisor agreements have strict requirements for numerous brand elements, including many components of the building exterior architecture. Deviation from these franchisor requirements would result in denial from Taco Bell corporate. This is a critical issue and denial of this variance request would cause the project to be abandoned.



GENERAL SPECIFICATIONS:

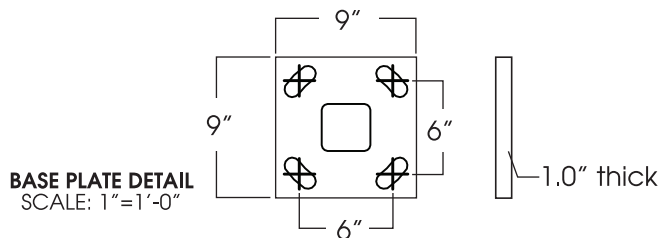
- Materials: Aluminum sheets & steel tubes
- Decoration: Powder coat Taco Bell Bronze & black
- Menu Board Area Squared: 44.50 Sq. Ft.
- Weight (Est.):
 - 745 lbs. (crated)
 - 545 lbs. (uncrated)

ELECTRICAL

- Illumination:
 - White LEDs
- Power Supplies:
 - (2) 062-00008 Electronic LED Power Supplies
- Line Load:
 - 1.92 amps @ 120 vac-60Hz
 - (1) 20 Amp circuit

COLORS:

- Exterior:
- Doors & Mullions: Powder coat Taco Bell Black
- Cabinet: Powder coat Taco Bell Bronze



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Everbrite LLC
4949 S 110th Street, Greenfield, WI 53220
Phone: 414-529-3500 • Fax: 414-529-7191
Website: www.everbrite.com

Part No: E003534P
Description: Drive Thru Evolution LED VE Menuboard

Project No: 291388-2
Date: 2/12/13
Drawn By: RB





L-Series V-Net™ Outdoor Display System 9320-150

Delphi Display System's V-Net™ 15" Outdoor Display is designed for QSR drive-thru applications that require direct sunlight readability and reliable operation in harsh environments. The L-Series V-Net™ Display by Delphi uses proprietary LED backlight technology to provide an exceptionally bright and vivid color 15" LCD with the longest life on the market today.

The V-Net™ Display functions similar to a PC monitor allowing the video source for the display to be located within the store. With the PC in the store, the system performance can be matched to the needs of each specific application without changing the outdoor display hardware. The result is a highly reliable and scalable solution at the lowest possible total cost of ownership.

LONGEST DISPLAY LIFE 70,000 HOUR BACKLIGHT

Only Delphi's custom designed display has an LED backlight with a 70,000 hour MTTH (Mean Time to Half-brightness). It's the longest life backlight on the market today – the display should be bright for nearly 8 years of continuous operation!

NEW SCREEN DESIGN

Delphi display screens have a new look that is contemporary, sleek and compelling. An all-glass front window with black glass bezel make Delphi's display stand apart from the rest of the industry and your customers will take notice.

BRIGHTEST SCREEN

The V-Net™ LCD display is exceptionally bright at 1,600 nits and provides vivid and high contrast color saturation. Only Delphi couples the industry's brightest screen technology with the most advanced anti-glare and anti-reflection technology to deliver optimal readability in direct sunlight. The ECU continually adjusts the display brightness for maximum contrast in all ambient light conditions. With Delphi, you'll soon discover an easy-to-read order is quickly confirmed so you can keep your drive-thru moving.

LONGEST WARRANTY

In the unlikely event the display needs servicing, it is covered by a 5 year warranty, the longest in the industry. The Delphi warranty includes Advance Exchange service, ensuring you receive a fully-functioning unit as soon as possible to minimize downtime in your drive-thru.

GREEN TECHNOLOGY

The Delphi V-Net™ Display is power efficient, the LED backlights use 40% less energy and produce less heat which improves performance in extreme temperatures. Delphi displays are RoHS (Restriction of Hazardous Substances Directive) compliant and made of 100% recyclable materials making them environmentally-friendly, green, and clean.

HIGHLY RELIABLE

Delphi's V-Net™ Display has performed in the field with greater than 99% reliability. The Display contains a proprietary Environmental Control Unit (ECU) that performs all system thermal management functions. This ensures reliable operation in extreme temperatures so QSRs can maintain fast drive-thru times in any climate. High impact safety glass protects the display and internal components from vandalism. Software utilities are available to facilitate remote, health and status monitoring, enabling you to focus on your business, not your display.

MOUNTING OPTIONS

The V-Net™ Display can be easily adapted to a wide variety of mounting configurations including stand-alone speaker posts, canopies, menu boards, and pre-sell displays to complement the unique esthetics of your drive-thru.



L-Series V-Net™ Outdoor Display System Product Specification

9320-150-VC5-RL

Input Power

Voltage	100-240 VAC (Auto Sensing)
Frequency	50-60 Hz
Power	44 Watts Typical (full brightness, heater off)

Display

Type	Color AM/TFT Liquid Crystal Display (LCD)
Size	15in/38.1cm Diagonal (12.0in w x 9.0in h, 30.48cm x 22.86 cm)
Backlight Type	White LED
Luminance	1,600 Cd/m2 (Nits)
LCD Resolution	1024w x 768h Pixels (XGA)
VGA Input Resolution	640x480 to 1024x768 @ 75 Hz. (max.)

Interface

VGA Input (VNET™ Interface)	RJ-45 (requires VNET™ 1600-VNET-TX-R Video Transmitter)
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Reliability (MTBF)

System (excluding backlight)	>53,000 hours
LED Backlight	70,000 hours (MTTH)

Construction

Enclosure	IP65 / NEMA4, Environmentally Sealed, Conduction Cooled, Welded Aluminum, Machined Aluminum and Stainless Steel
Finish	Powder Coat and Anodized
Glass	Safety glass with UV and IR blocking filters

Environmental

Operating Temperature	-40°F to +140°F/-40°C to +60°C (ambient)
Heater	60 Watts

Physical (Display Only)

Dimensions	15½"w x 12¾"h x 6½"d (39.37cm x 32.39cm x 11.4cm)	<i>outer frame on this dimension</i>
Weight	16 lbs. (7.3 kg)	

Compliance

RoHS Compliant	Yes
WEEE Compliant	Yes

AGENCY APPROVALS

- UL60950-1, 2nd Edition, 2007-10-31 (Information Technology Equipment Safety – Part 1: General Requirements)
- CSA C22.2 No. 60950-1-03, 2nd Edition, 2006-07 (Information Technology Equipment Safety – Part 1: General Requirements) – File #NWGQ.E154563, #NWGQ7.E154563, Report reference #E154563-Ar-UL-1
- EMC:
 - Radiated Emissions:**
 - AS/NZS CISPR 22:2009 Class A; Test method – AS/NZS CISPR 22:2009
 - FCC Part 15.109(g) (CISPR 22:1997):2010 Class A; Test method - ANSI C63.4:2009
 - ICES-D03:2004 Class A; Test method – CISPR 22:2005 (Amended by A1:2005 and A2:2006)
 - VCCI:2009-04 Class A; Test method – VCCI:2009-04
 - Conducted Emissions:**
 - AS/NZS CISPR 22:2006 Class A; Test method – CISPR 22:2005 (Amended by A1:2005 and A2:2006)
 - FCC 15.107:2010 Class A; Test method – ANSI C63.4:2009
 - ICES-D003:2004 Class A; Test method – CISPR 22:2005 (Amended by A1:2005 and A2:2006)
 - VCCI:2009-04 Class A; Test method – VCCI:2009-04
 - EN60950 Safety of Information Technology Equipment

CONFIRM ORDER HERE



Marvin Development IV, LLC – Taco Bell

Narrative for Variance Request for Relief from the 35' Setback Requirement from Tall Pine Lane

The current city code requires a 35' setback from Tall Pine Lane. The variance request is for 13' feet as the proposed building location is 22' feet from the property line.

The proposed site plan would need to be compressed to find 13' feet in width. Building dimensions and sidewalk width cannot be adjusted because of ADA requirements because of turning radius and sidewalk minimum widths. The storm water detention pond has been designed to take run off from the frontage road. The city and the developer have preliminarily agreed that in exchange for the developer to take storm runoff from the city, the city will provide the maintenance for the storm water pond. Reducing the size of the pond may result in a reduced capacity or no capacity to accept city run off. A reduction in pond capacity would also result in more difficulty for city staff to maintain the structures.

The only other available width to reduce would be the drive aisle. A reduction in drive aisle width would result in a drive aisle width of 17' feet. This width would be unacceptable for two-way traffic movements.



DEPARTMENT OF PUBLIC WORKS

1307 Cloquet Avenue; Cloquet, MN 55720
Phone: (218) 879-6758 Fax: (218) 879-6555
Street - Water - Sewer – Engineering - Park
www.ci.cloquet.mn.us

MEMO

To: Al Cottingham, City Planner
From: John Anderson, Assistant City Engineer
Date: March 01, 2017

SUBJECT: Taco Bell Plan Review

I have reviewed the site plans for the Proposed Taco Bell at 1418 Hwy 33, dated 2/17/17, submitted by Finn Daniels Architects and drainage calculations prepared by Civil Engineering Site Design. In general the plans meet the expectations discussed in the pre design meeting and the storm water treatment meets the requirements of the city code. With that being said the following are my comments on the plans submitted, comments need to be address before proceeding to construction.

Sheet C1.0 Site Plan

1. Site Plan Note #12 should be modified to read “**Public and Private** Sidewalks shall be constructed with cross slope of 1.5% with adjustment +/- 0.5%. Sidewalks will be inspected after construction, any sidewalk exceeding 2.0% cross slope will need to be replaced at contractors expense.”

Sheet C2.0 Grading and Drainage Plan

1. Label the following on the storm water pond
HWL - 100 yr 1203.26, 10 yr 1203.05, 2 yr 1202.59
NWL - dry

Sheet C3.0 Utility Plan

1. The new concrete curb on Tall Pine Lane should extend another 15 feet westerly to incorporate the existing catch basin into new the curb line. The casting on this catch basin shall be replaced with an R-3067 casting.
2. The sanitary sewer service will need a grease trap either internal or external to the building.
3. The sewer service may use the existing wye connection to the sewer main in Tall Pine lane if it is found to be in satisfactory condition.
4. Since this site is located within the Drinking Water Surface management area (DWSMA) and infiltration is discouraged, the storm water pond should have 4 inch perforated drain tile around the perimeter of the pond following approximately the 1202 contour and connecting to the outlet structure. This drain tile should be constructed with a locating wire.

Sheet C8.0 Standard Details

1. The elevations shown on the typical infiltration basin cross section are not correct.
2. Show the drain tile in the typical infiltration basin cross section.
3. Remove the word "If" at the beginning of note number 3 infiltration basin general notes.

Sheet L3 Landscape Details

1. The TYPE A seeding for the stormwater basin take some time to establish. How will acceptance of the growth be verified. And how long does it need to get established, probably more than one growing season?

Drainage Calculations

1. Revise the calculations to account for the drain tile in the storm water pond.

General Civil Comments

1. The site work will require the following city permits Grading, Water/Sewer, right of way occupation
2. An NPDES construction permit will be required from the MPCA.
3. A maintenance agreement should be drafted to describe the city's role and the property owner's role as it pertains to the storm water pond. In general the city will maintain the storm water function of the pond but will not maintain landscaping functions.

SITE PLAN NOTES:

- ALL DIMENSIONS SHOWN ARE TO FACE OF CURB, EDGE OF SIDEWALK OR EXTERIOR OF BUILDING UNLESS OTHERWISE NOTED. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS AND SPECIFICATIONS FOR LOCATION OF EXITS, RAMPS, CONCRETE APRONS AND STOOPS.
- TACK SHALL BE USED ON BITUMINOUS EDGE PRIOR TO PATCHING. MATCH EXISTING GRADES.
- ALL CONCRETE SIDEWALKS ADJACENT TO BUILDING SHALL BE SEPARATED WITH A 1/2" EXPANSION JOINT.
- CONTRACTOR SHALL VERIFY ALL CONDUIT REQUIREMENTS FOR MONUMENT SIGN POWER, LIGHTING, IRRIGATION, MENU BOARD, ORDER CONFIRMATION BOARD AND CANOPY, ETC WITH OWNER PRIOR TO PAVING.
- CONTRACTOR SHALL VERIFY LOCATION OF THE MENU BOARD, ORDER CONFIRMATION BOARD AND CANOPY, AND CLEARANCE BAR WITH OWNER PRIOR TO PLACEMENT.
- ACCESSIBLE ROUTE SHALL BE PROVIDED FROM ACCESSIBLE STALLS TO BUILDING ENTRANCE (SEE ADAAG REQUIREMENTS). POLE MOUNT APPROVED SIGNS CENTERED ON STALLS. PAINT INTERNATIONAL SYMBOL OF ACCESSIBILITY ON STALL.
- CONSTRUCT ACCESSIBLE PEDESTRIAN RAMP PER ADAAG AND MNDOT STANDARDS INCLUDING CONTRASTING DETECTABLE WARNING METAL TRUNCATED DOME PANELS.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH FIRE MARSHAL FOR POSTING OF FIRE LANES, CURB MARKING AND SIGNAGE IF NEEDED.
- CONTRACTOR IS RESPONSIBLE FOR DEMOLITION AND REMOVAL OF ALL EXISTING STRUCTURES THAT INTERFERE WITH NEW WORK AS SHOWN.
- ALL LANDSCAPE AREAS ARE TO BE IRRIGATED.
- ALL NEW UTILITIES MUST BE UNDERGROUND. COORDINATE LOCATIONS WITH LOCAL UTILITY COMPANIES.
- SIDEWALKS SHALL BE CONSTRUCTED WITH CROSS SLOPE OF 1.5% WITH ADJUSTMENT +/- 0.5%. SIDEWALKS WILL BE INSPECTED AFTER CONSTRUCTION. ANY SIDEWALK EXCEEDING 2.0% CROSS SLOPE WILL NEED TO BE REPLACED AT CONTRACTORS EXPENSE.

GENERAL NOTES:

- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY THE PERMITTING AUTHORITIES.
- WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF THE LOCAL GOVERNING AUTHORITY. THE SOILS REPORT AND RECOMMENDATION SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND IN CASE OF CONFLICT SHALL TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY DISCREPANCY ON THE PLANS.
- SITE CLEARING SHALL INCLUDE THE LOCATION AND REMOVAL OF ALL UNDERGROUND PIPING, VALVING, ETC.
- SITE GRADING SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE SOILS REPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ALL SOFT, YIELDING OR UNSUITABLE MATERIALS AND REPLACING WITH SUITABLE MATERIALS AS SPECIFIED. CONTRACTOR SHALL SUBMIT A COMPACTION REPORT PREPARED BY A QUALIFIED SOILS ENGINEER, LICENSED WITHIN THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AND PAVEMENT AREAS HAVE BEEN COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS AND RECOMMENDATIONS SET FORTH IN THE SOILS REPORT.
- THE LOCATIONS OF THE UNDERGROUND FACILITIES SHOWN ON THIS PLAN ARE BASED ON FIELD SURVEYS AND LOCAL UTILITY COMPANY RECORDS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES TO LOCATE THEIR FACILITIES PRIOR TO STARTING CONSTRUCTION. NO ADDITIONAL COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR DAMAGE AND REPAIR TO THESE FACILITIES CAUSED BY HIS WORK FORCE.
- ALL EXISTING DIMENSIONS AND GRADES SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY OWNER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
- ALL EXISTING CONCRETE CURBING AND PAVEMENT TO REMAIN SHALL BE PROTECTED FROM DAMAGE. CONTRACTOR TO REPAIR ANY DAMAGED EXISTING CURB AND PAVEMENT AT CONTRACTORS EXPENSE.
- CONTRACTOR TO PROVIDE REQUIRED BONDING AND/OR INSURANCE FOR CONSTRUCTION PERMITS AS REQUIRED BY THE LOCAL GOVERNING AUTHORITY.

SITE DATA:

ZONING: RC REGIONAL COMMERCIAL
 PROPOSED USE: RESTAURANT WITH DRIVE-THROUGH
 GROSS LOT AREA: 59,996 SQ. FT. OR 1.38 ACRES
 EX. ROAD EASEMENT AREA: 9,000 SQ. FT. OR 0.21 ACRES
 NET LOT AREA: 50,996 SQ. FT. OR 1.17 ACRES

PROPOSED BUILDING FOOTPRINT AREA: (GFA) 2,690 SQ. FT.
 (Excludes trash enclosure)
 PERCENT PROPOSED BUILDING COVERAGE: 5.3%
 (% of net lot area)
 PROPOSED BUILDING FLOOR AREA RATIO 0.053
 (2,690 / 50,996)

EXISTING IMPERVIOUS AREA: 25,361 SQ. FT.
 (building, sidewalk, & pavement)
 PERCENT EXISTING IMPERVIOUS AREA: 49.7%
 (25,361 / 50,996)

EXISTING PERVIOUS AREA: 25,635 SQ. FT.
 PERCENT EXISTING PERVIOUS AREA: 50.3%
 (25,635 / 50,996)

PROPOSED IMPERVIOUS AREA: 27,080 SQ. FT.
 (building, sidewalk, & pavement)
 PERCENT PROPOSED IMPERVIOUS AREA: 53.1%
 (27,080 / 50,996)

PROPOSED PERVIOUS AREA: 23,916 SQ. FT.
 PERCENT PERVIOUS AREA: 46.9%
 (23,916 / 50,996)

SHEET INDEX:

- C1.0 SITE PLAN
- C2.0 GRADING AND DRAINAGE PLAN
- C3.0 UTILITY PLAN
- C4.0 STORM WATER POLLUTION PREVENTION PLAN
- C5.0 EXISTING CONDITIONS PLAN
- C6.0 DEMOLITION PLAN
- C7.0 LIGHTING PLAN
- C8.0 STANDARD DETAILS

SITE PLAN LEGEND:

- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT LIGHT DUTY
- CONCRETE PAVEMENT HEAVY DUTY
- 612 CURB AND GUTTER STANDARD
- 612 CURB AND GUTTER TIP-OUT
- EXISTING CURB AND GUTTER
- PARKING COUNT
- TRAFFIC DIRECTION ARROWS

PARKING DATA:

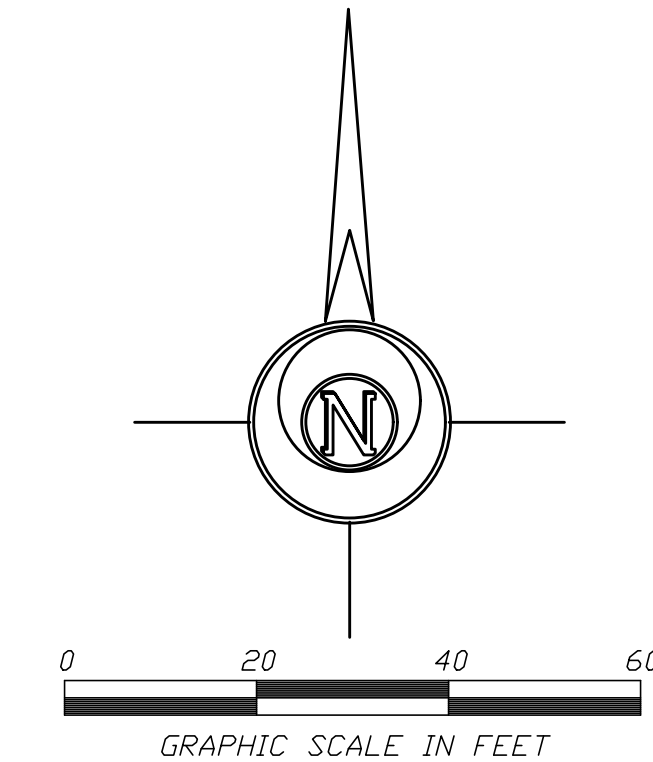
PARKING STALLS:

Proposed 9.0 x 20.0 34 Stalls
 Proposed Accessible (ADA) 2 Stalls
 Proposed Total : 36 Stalls

Required Parking Stalls:
 1/40 sf x 686 sf DINING 17 Stalls
 1/40 sf x 237 sf PATIO 6 Stalls
 1/80 sf x 1,066 sf KITCHEN 13 Stalls
 36 Stalls

DRIVETHRU STACK:

Provided Drivethru Stack: 9 Vehicles



SITE PLAN BASED ON SURVEY INFORMATION DATED JANUARY 27, 2017 PROVIDED BY ALTA LAND SURVEY COMPANY.

LEGAL DESCRIPTION:

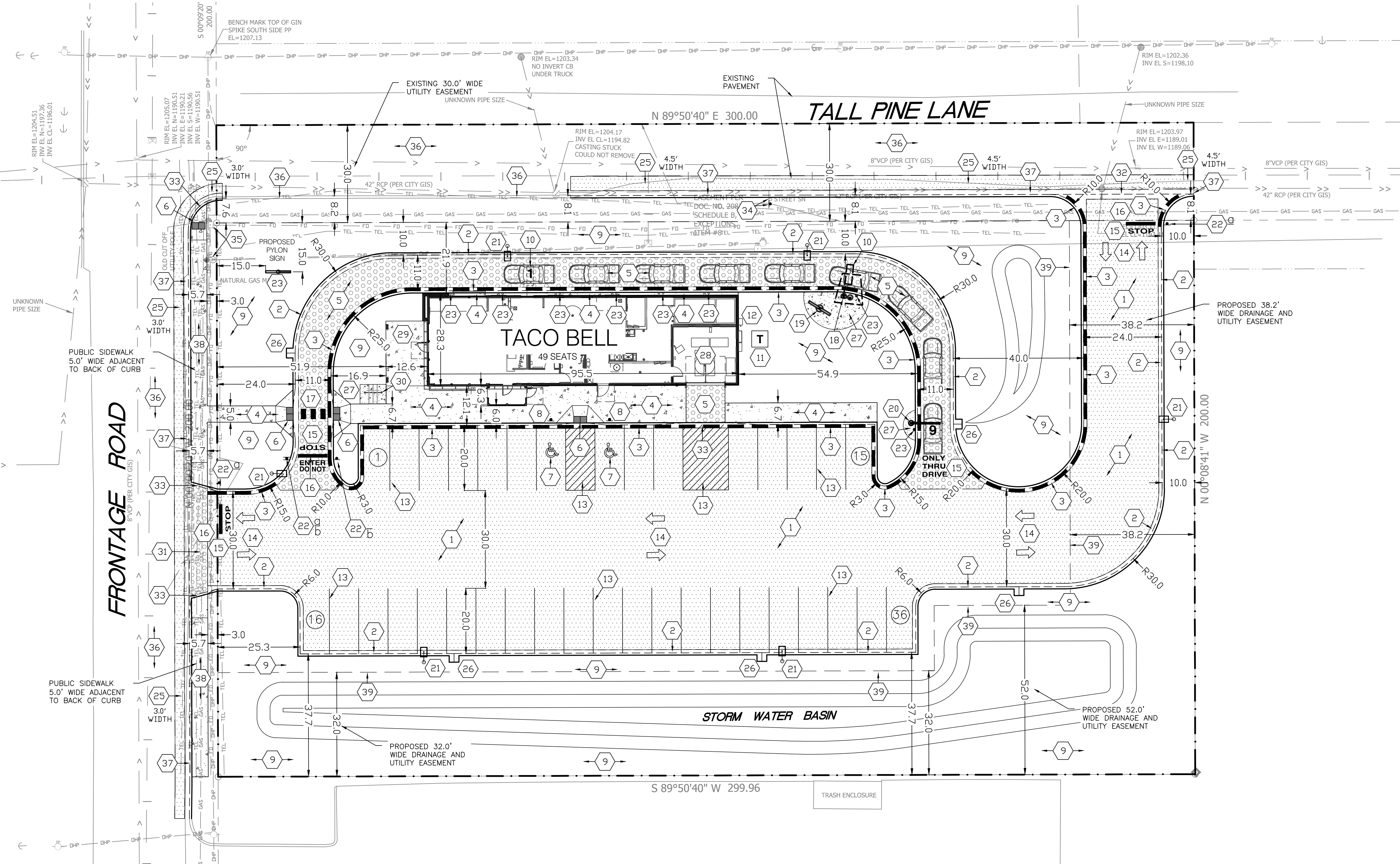
PART OF THE SE 1/4 OF THE NE 1/4 SECTION 26, TOWNSHIP 49, NORTH OF RANGE 17, WEST OF THE FOURTH PRINCIPAL MERIDIAN, CARLTON COUNTY, MINNESOTA, SEE SURVEY FOR FULL LEGAL

BENCHMARK:

TOP OF GIN SPIKE IN SOUTH SIDE UTILITY POLE LOCATED IN THE NE QUADRANT OF THE INTERSECTION OF THE HWY. 33 FRONTAGE ROAD AND TALL PINE LANE. BENCH MARK IS SHOWN ON SURVEY. ELEVATION=1207.13 FEET.

KEY NOTES

- BITUMINOUS PAVEMENT AS SPECIFIED BELOW:
 (PARKING LOT ONLY) ASPHALT PAVING SECTION HEAVY DUTY MNDOT SPECIFICATIONS
 BIT. WEAR COURSE 2" SPWEA240B, MndOT 2360
 BIT. BASE COURSE 2" SPNWB230B, MndOT 2360
 AGGREGATE BASE (CL 5) 6" 2211
- COMPACTION DENSITY BETWEEN 95% AND 100% OF THE MARSHALL DENSITY. 100% FOR AGGREGATE BASE.
 SOIL ENGINEER RECOMMENDATIONS SUPERSEDE ABOVE LISTED SPECS.
- 612 (6") CONCRETE CURB & GUTTER. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT.
- 612 (6") CONCRETE OUTFLOW CURB & GUTTER. (TIP-OUT FLOWLINE). MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT.
- CONCRETE SIDEWALK, WIDTH VARIES. 4" CONCRETE SIDEWALK W/6"x6"-#10/10 W.W.M. (CONST. JTS @ 6' O.C.) OVER 4" CLASS 5 AGGREGATE BASE. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT. CROSS SLOPE MAX. 2.0%.
- 6" CONCRETE PAVEMENT W/6"x6"-#10/10 W.W.M. (CONST. JTS @ 12' O.C.) OVER 4" CLASS 5 AGGREGATE BASE. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT. SOILS SPECIFICATIONS SUPERSEDE ABOVE LISTED SPECS.
- PED RAMP TO COMPLY WITH AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS. REFERENCE MNDOT STANDARD PLAN 5-297.250.
- PAINT INTERNATIONAL SYMBOL OF ACCESSIBILITY-WHITE LATEX PAINT.
- ACCESSIBLE PARKING SIGN (MNDOT #S R7-8A AND R7-8B). CENTER SIGN ON PARKING STALL LOCATION PER GENERAL CONTRACTOR. MOUNT ON 6" CONCRETE BOLLARD. SEE DETAIL SHEET.
- PERVIOUS AREA. SEE LANDSCAPE PLAN.
- SENSOR LOOP. INSTALLED BY SIGN COMPANY. CONFIRM WITH ARCHITECTURAL PLANS.
- TRANSFORMER PAD BY GENERAL CONTRACTOR. INSTALL PER UTILITY COMPANY SPECIFICATIONS.
- GAS SERVICE METER LOCATION. GAS SERVICE UTILITY COMPANY TO PROVIDE METER.
- PAINT 4" WIDE SOLID STRIPE - WHITE.
- PAINT TRAFFIC ARROWS - WHITE.
- PAINT 24" HIGH LETTERS - WHITE.
- PAINT 24" WIDE SOLID STRIPE - WHITE.
- PAINT 36" WIDE CROSSWALK STRIPING - WHITE.
- ORDER CONFIRMATION BOARD. INSTALLED BY SIGN COMPANY. FOUNDATION BY GENERAL CONTRACTOR. VERIFY SIZE WITH OWNERS ARCHITECT. SEE ARCHITECT PLANS FOR DETAILS.
- MENU BOARD. INSTALLED BY SIGN COMPANY. FOUNDATION BY GENERAL CONTRACTOR. VERIFY SIZE WITH OWNERS ARCHITECT. SEE ARCHITECT PLANS FOR DETAILS.
- CLEARANCE BAR INSTALLED BY SIGN COMPANY. FOUNDATION BY GENERAL CONTRACTOR. SEE ARCHITECT PLANS FOR DETAILS.
- LIGHT POLE. REFER TO LIGHTING AND PHOTOMETRIC PLAN FOR LIGHT LOCATIONS AND SPECIFICATIONS. FOUNDATIONS BY GENERAL CONTRACTOR. VERIFY FOUNDATION SIZE WITH OWNERS ARCHITECT.
- INSTALL SIGNS, MOUNTED ON 6" CONCRETE BOLLARD. SIGNS TO BE PLACED BACK TO BACK ON SAME BOLLARD. GENERAL CONTRACTOR TO COORDINATE LOCATION.
 a) "STOP" SIGN
 b) "DO NOT ENTER" SIGN
- PROPOSED PYLON POLE WITH ELEVATED SIGN CABINET.
- GUARD POST BOLLARD. SEE DETAIL SHEET.
- SAWCUT AND REMOVE EXISTING BITUMINOUS FOR CLEAN EDGE. WIDTH VARIES (MIN. 3.0') FROM CONCRETE LIP EDGE AT CURB OR VALLEY CUTTER. PATCH WITH HEAVY DUTY BITUMINOUS PAVEMENT. MATCH EXISTING PAVEMENT ELEVATIONS AND CROSS SLOPE.
- CURB OPENING 3 FEET WIDE WITH CONCRETE SPILLWAY (3"x2'L). FORM FLOWLINE AT CENTER OF SPILLWAY. SPILLWAY CONCRETE SECTION TO BE INTEGRAL WITH CONCRETE CURB AND GUTTER.
- CONCRETE PAVEMENT, WIDTH VARIES. 4" CONCRETE W/6"x6"-#10/10 W.W.M. (CONST. JTS @ 6' O.C.) OVER 4" CLASS 5 AGGREGATE BASE. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT.
- TRASH ROOM INSIDE BUILDING. SEE ARCHITECT PLANS FOR DETAILS.
- OUTDOOR TABLES AND SEATING. SEE ARCHITECTURAL DRAWINGS. OWNER SUPPLIED. CONTRACTOR INSTALLED.
- BIKE RACK. SEE PROJECT SPECIFICATIONS. ANCHOR RACK TO (2) 12" DIA. x 4'-0" CONCRETE PIER FOOTINGS FORMED BY SONOTUBES. MATCH CONCRETE ELEVATION WITH TOP OF PAVERS. TRIM PAVERS AROUND FOOTINGS.
- CONCRETE DRIVEWAY APRON PER CITY STANDARDS. USE 8" THICK CONCRETE MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT. NO REINFORCEMENT.
- 36" CONCRETE VALLEY CUTTER PER CITY STANDARDS. USE 8" THICK CONCRETE MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT. NO REINFORCEMENT.
- DEPRESS BACK OF CURB TO ACCOMMODATE SIDEWALK AND/OR FACILITY ACCESS.
- RELOCATE EXISTING STREET SIGN OFFSET 2.0' BEHIND NEW CURB. CONTRACTOR TO SALVAGE, STORE, PROTECT, AND INSTALL STREET SIGN.
- EXISTING UTILITY TO REMAIN IN PLACE. CONTRACTOR TO PROTECT.
- EXISTING CONCRETE CURB AND GUTTER, OR BITUMINOUS PAVEMENT TO REMAIN IN PLACE. CONTRACTOR TO PROTECT.
- 612 (6") CONCRETE CURB & GUTTER. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT.
- CONCRETE SIDEWALK, 5.0' WIDTH, ABUT TO BACK OF CURB. 4" CONCRETE, NO REINFORCEMENT. CONST. JTS @ 6' O.C. 4" CLASS 5 AGGREGATE BASE. MndOT 2461 MIX 3Y22A SLIPFORM PLACEMENT OR MndOT 2461 MIX 3Y32A MANUAL PLACEMENT. CROSS SLOPE MAX. 2.0%.
- PROPOSED DRAINAGE AND UTILITY EASEMENT LINE FOR STORM WATER MANAGEMENT AND CONVEYANCE FROM FRONTAGE ROAD TO TALL PINE LANE.



finn daniels
 ARCHITECTS
 2145 Ford Parkway, Suite 301
 Saint Paul, Minnesota 55116
 651.690.5525
 www.finn-daniels.com

Consultant
 SITE CONSTRUCTION PLANS PREPARED BY:

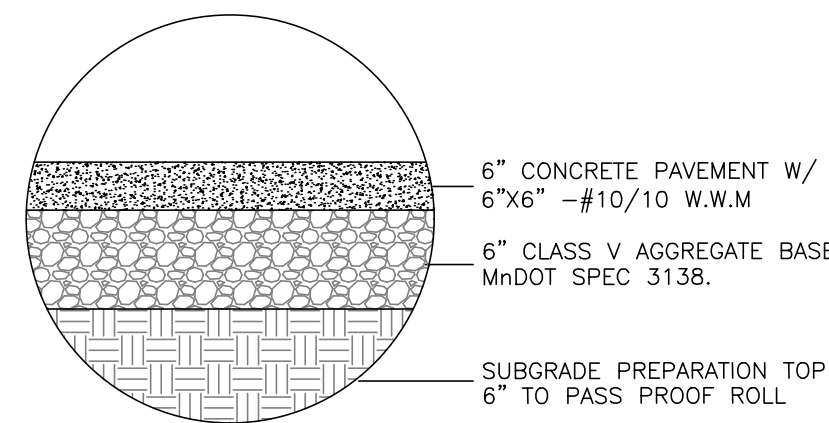
 CIVIL ENGINEERING
 SITE DESIGN
 118 East Broadway St.
 PO Box 566
 Monticello, Mn 55362
 Phone: 763-314-0929
 www.civiled.com
 I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of Minnesota.
 Printed Name: SCOTT DAHKE
 Signature:
 Date: 02/17/17 License #: 24348

TACO BELL
 EXPLORER LITE
 MEDIUM 40
 1418 HWY. 33 SOUTH
 CLOQUET, MN 55720

DEVELOPED BY:
 BORDER FOODS
 5425 BOONE AVE. N
 NEW HOPE, MINNESOTA 55428

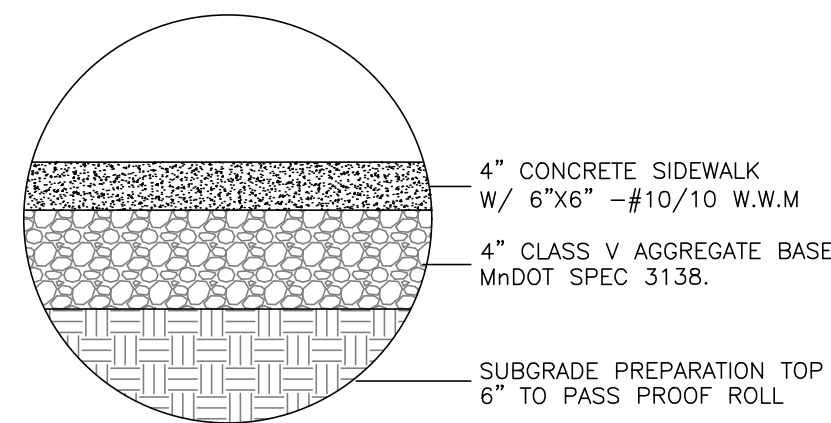
PROJECT NO.: TB17-01
 DRAWN BY:
 CHECKED BY:
 ISSUES AND REVISIONS:
 CITY REVIEW SUBMITTAL 02/17/2017

SITE PLAN
C1.0
 TACO BELL CLOQUET, MN



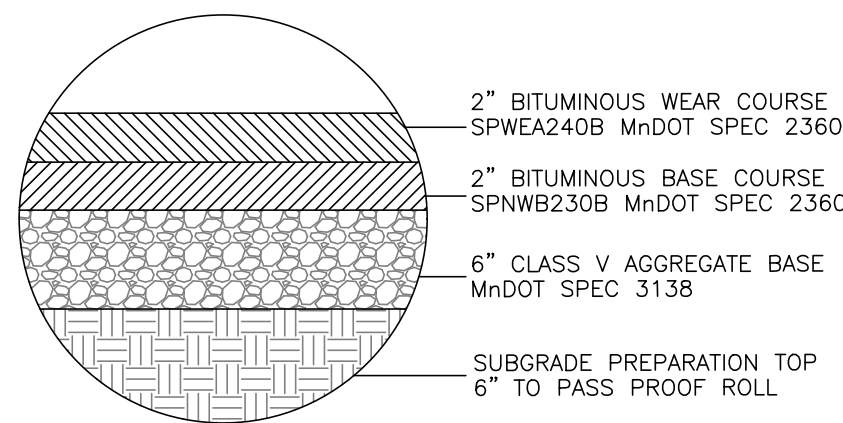
- NOTES:
1. CONCRETE MIX SHALL CONFORM TO MNDOT SPEC. 2461 MIX No. 3Y22A FOR SLIPFORM PLACEMENT MIX No. 3Y32A FOR MANUAL PLACEMENT
 2. CONTRACTOR SHALL SPACE THE CONTRACTION JOINTS AT 12'-0" O.C.
 3. CONTRACTOR SHALL PROVIDE EXPANSION JOINTS AT APPROXIMATE 48.0 FOOT SPACING. EXPANSION JOINT MATERIAL TO BE 1/2" PREFORMED FILLER MATERIAL PER MNDOT SPECIFICATION 3702.

CONCRETE PAVEMENT HEAVY DUTY



- NOTES:
1. CONCRETE MIX SHALL CONFORM TO MNDOT SPEC. 2461 MIX No. 3Y22A FOR SLIPFORM PLACEMENT MIX No. 3Y32A FOR MANUAL PLACEMENT
 2. CONTRACTOR SHALL SPACE THE CONTRACTION JOINTS AT 6'-0" O.C.
 3. CONTRACTOR SHALL PROVIDE EXPANSION JOINTS AT APPROXIMATE 48.0 FOOT SPACING. EXPANSION JOINT MATERIAL TO BE 1/2" PREFORMED FILLER MATERIAL PER MNDOT SPECIFICATION 3702.
 4. EXCLUDE W.W.M. IN SIDEWALK WITHIN PUBLIC RIGHT-OF-WAY.

CONCRETE PAVEMENT LIGHT DUTY



- NOTES:
1. CLASS V AGGREGATE BASE TO EXTEND 1.0 FEET BEHIND BACK OF CURB.
 2. SOILS SPECIFICATIONS SUPERSEDE ABOVE LISTED SPECIFICATIONS.

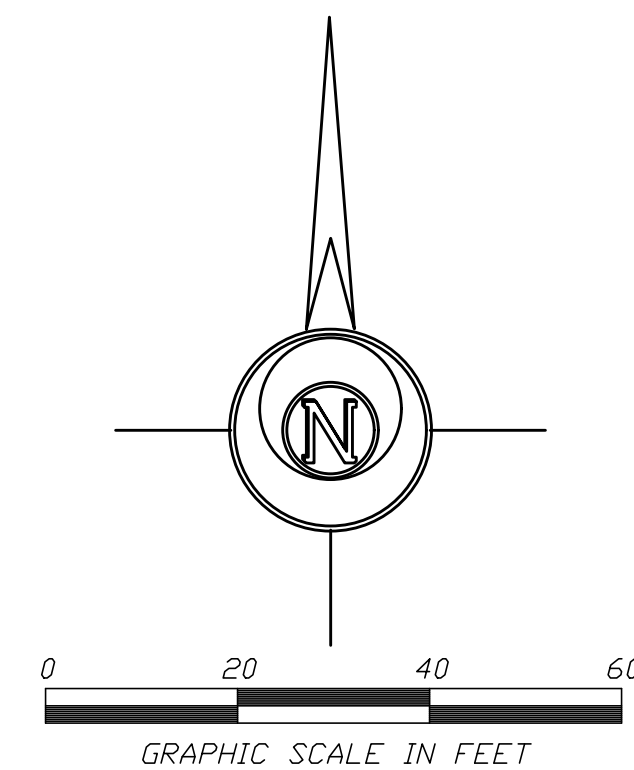
BITUMINOUS PAVEMENT

LEGAL DESCRIPTION:

PART OF THE SE 1/4 OF THE NE 1/4 SECTION 26, TOWNSHIP 49, NORTH OF RANGE 17, WEST OF THE FOURTH PRINCIPAL MERIDIAN, CARLTON COUNTY, MINNESOTA. SEE SURVEY FOR FULL LEGAL.

BENCHMARK:

TOP OF GIN SPIKE IN SOUTH SIDE UTILITY POLE LOCATED IN THE NE QUADRANT OF THE INTERSECTION OF THE HWY. 33 FRONTAGE ROAD AND TALL PINE LANE. BENCH MARK IS SHOWN ON SURVEY. ELEVATION=1207.13 FEET.



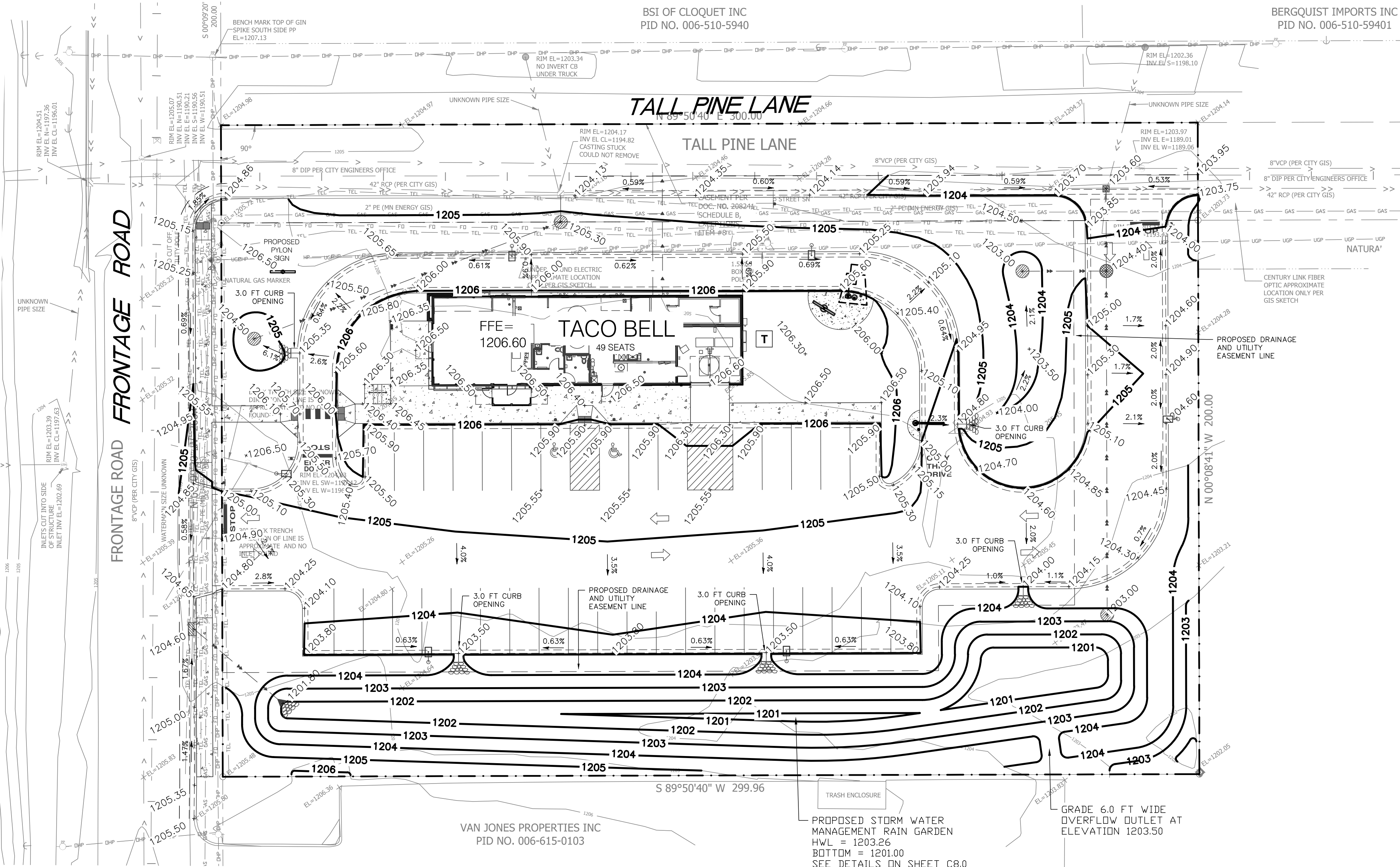
SITE PLAN BASED ON SURVEY INFORMATION DATED JANUARY 27, 2017 PROVIDED BY ALTA LAND SURVEY COMPANY.

GENERAL GRADING NOTES:

1. Specifications applicable for this project: Current standard specifications for Cloquet, MN, and the latest Minnesota Department of Transportation Specifications for Highway Construction and all NPDES requirements except where modified by these contract documents.
2. OSHA requirements shall be followed for all work on this project.
3. The Contractor shall notify "Gopher State One Call" 48 hours prior to any excavation (1-800-252-1166).
4. The Grading Contractor shall verify all locations and elevations of underground utilities with utility companies prior to any construction, and immediately notify the Engineer of any conflicts.
5. Erosion Control shall be constructed, as applicable, as sequenced below:
 - A. Silt Fence.
 - B. Rock Construction Entrance.
 - C. Demolition
 - D. Common excavation (grading).
 - E. Seed and mulch or sod (See notes on Landscape plan).
6. ALTA survey shall govern for easements and lot dimensions.
7. Any erosion control items necessary to protect adjacent properties shall be constructed by the Grading Contractor.
8. Erosion control maintenance shall be performed by the Grading Contractor, and removed as per the Contract Documents or as directed by the Engineer, followed by all necessary restoration of disturbed area. This work shall be incidental to the grading contract.
9. The Grading Contractor shall schedule the soils engineer to facilitate certification of all controlled fills in a timely fashion. Density tests shall meet the following:
 - A. Within the upper 3' of streets, the Grading Contractor shall utilize approved soils that are within 1% of the optimum moisture content as defined by the Standard Proctor Test-ASTM: D-698 with compaction meeting 100% Standard Proctor Density and not exceeding this compaction by more than 1%. Below the upper 3', compaction shall meet 95% Standard Proctor Density, and be within 3% of the optimum moisture content. Grading tolerances shall be 0.1'.
 - B. Grading tolerances for the remainder of the site shall be 0.25'.
10. All areas of unsuitable soils found in the pad described above that cannot be corrected shall be located in the field by the Grading Contractor. The Grading Contractor shall immediately notify the Engineer of these areas and provide information as to their size and location.
11. The Grading contractor shall provide positive drainage on the site at all times.
12. The Grading Contractor shall keep public streets and travel ways clear of soil and debris. Daily cleaning at the construction entrance shall be performed, especially at the end of each day's work.
13. All silt fence shall be removed at project completion.
14. All proposed elevations are at flow line unless otherwise noted.
15. All erosion control best management practices shall be per City standards.
16. Storage of materials or equipment shall not be allowed within public traveled roadways.

SHEET INDEX:

- C1.0 SITE PLAN
- C2.0 GRADING AND DRAINAGE PLAN
- C3.0 UTILITY PLAN
- C4.0 STORM WATER POLLUTION PREVENTION PLAN
- C5.0 EXISTING CONDITIONS PLAN
- C6.0 DEMOLITION PLAN
- C7.0 LIGHTING PLAN
- C8.0 STANDARD DETAILS



1418 HWY. 33 SOUTH
CLOQUET, MN 55720

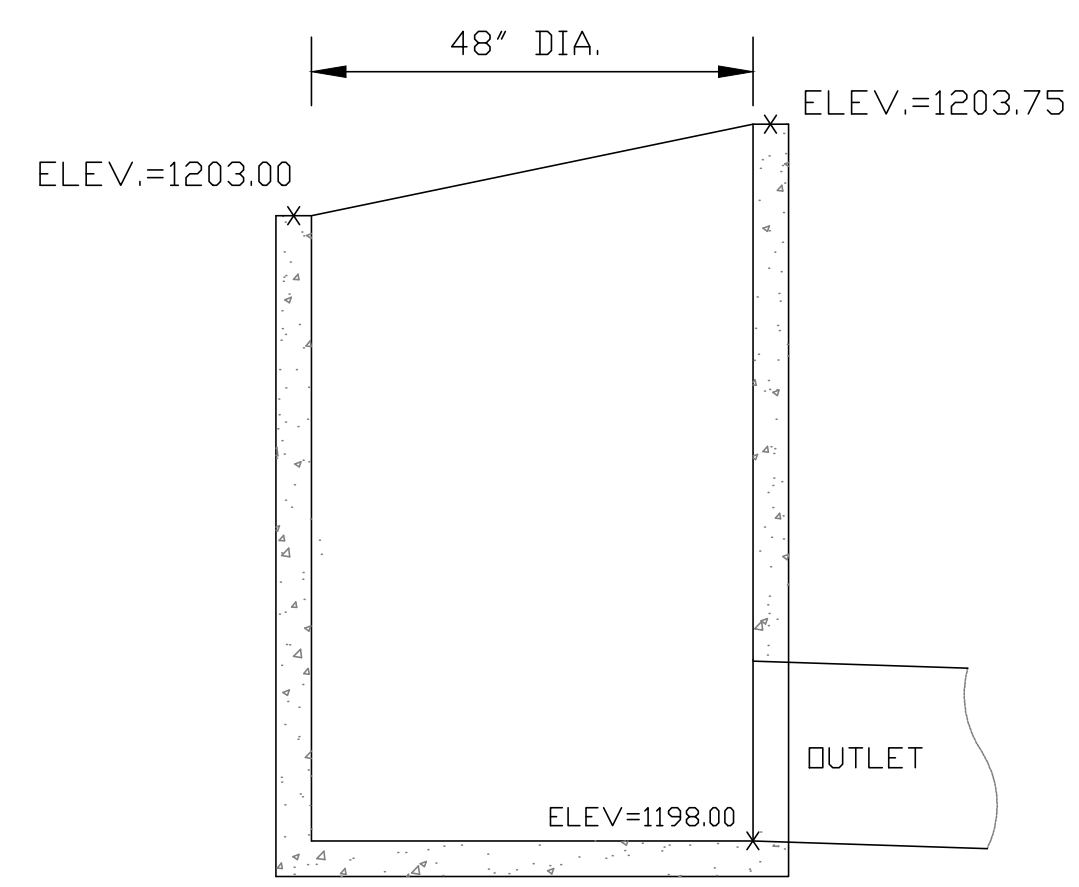
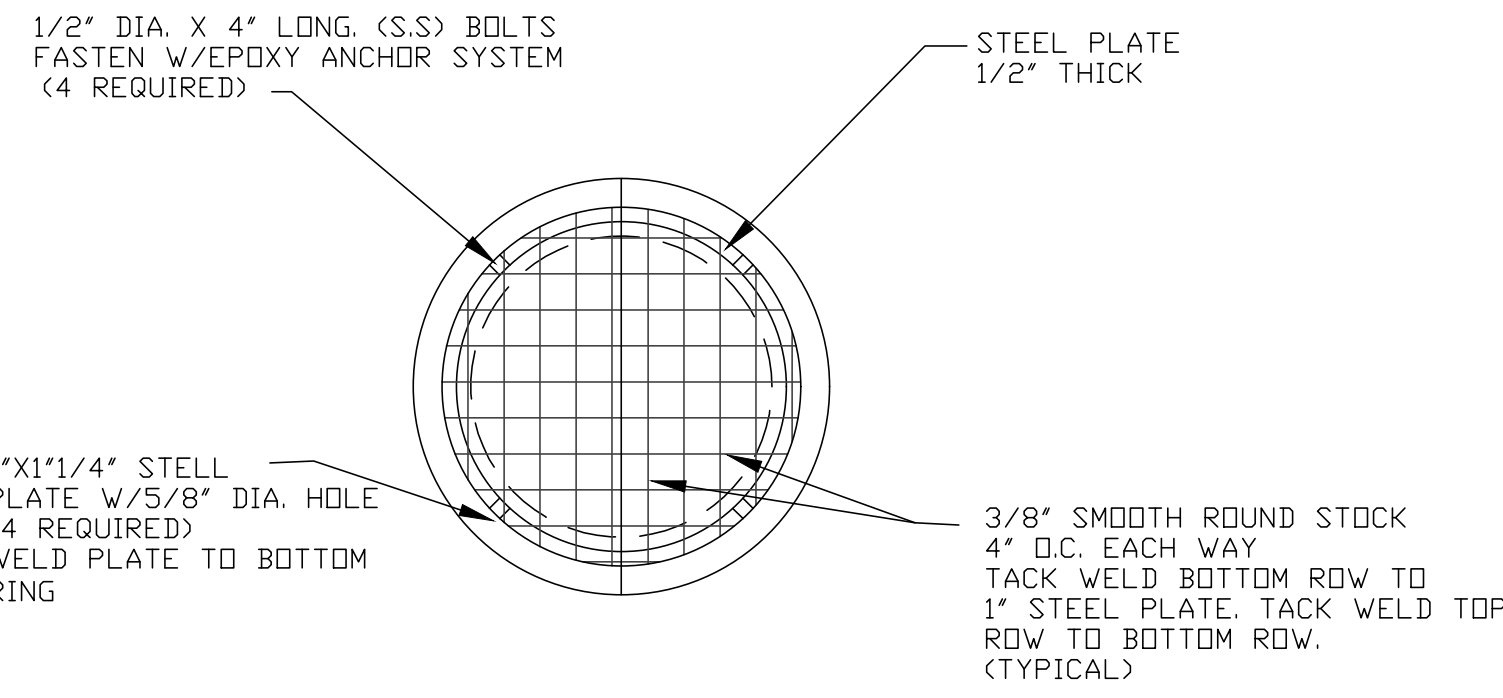
DEVELOPED BY:
BORDER FOODS
5425 BOONE AVE. N
NEW HOPE, MINNESOTA 55428

EXPLORER LITE - MEDIUM 40
XX SEATS / X,XXX S.F.

PROJECT NO.: TB17-01
DRAWN BY:
CHECKED BY:
ISSUES AND REVISIONS:
CITY REVIEW SUBMITTAL 02/17/2017

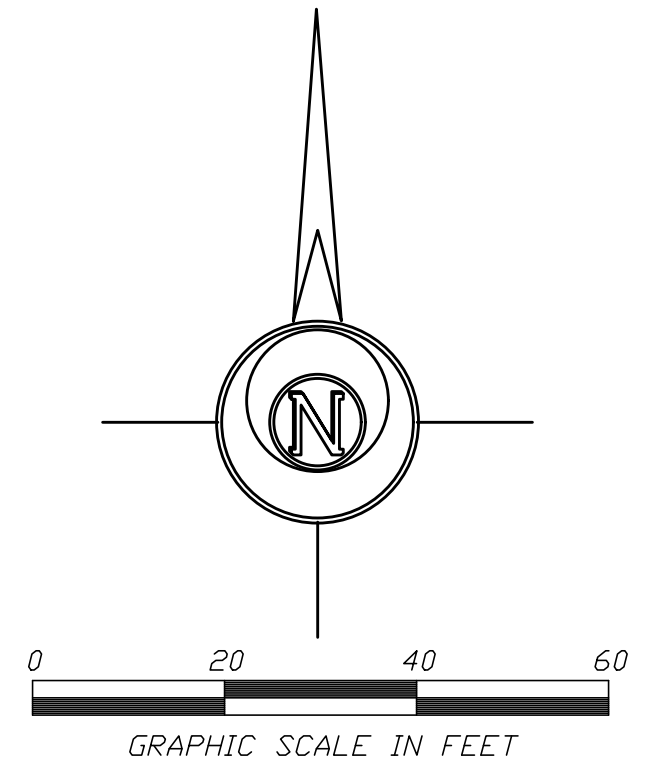
GRADING AND DRAINAGE PLAN

C2.0



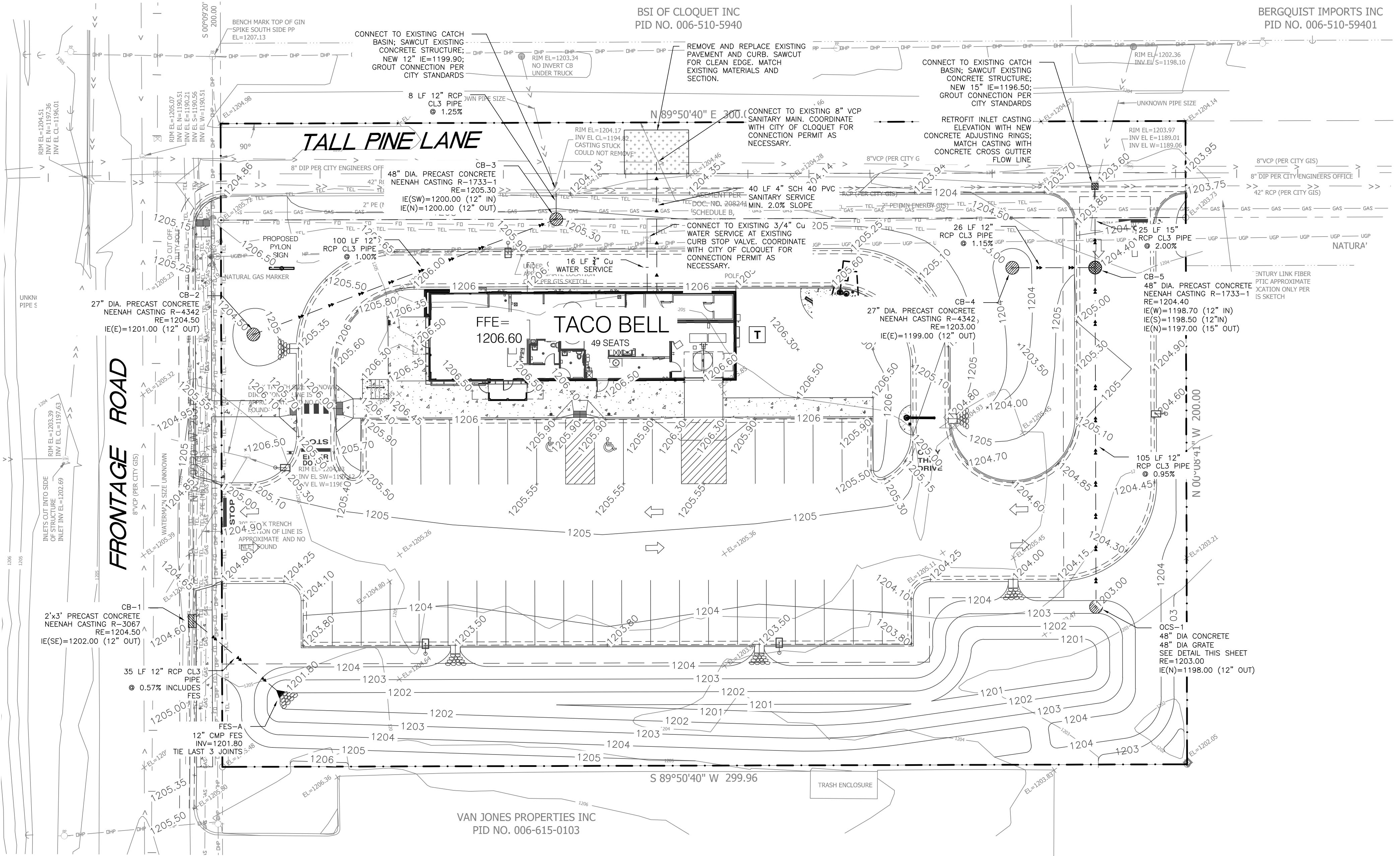
LEGAL DESCRIPTION:
 PART OF THE SE 1/4 OF THE NE 1/4, SECTION 26, TOWNSHIP 49, NORTH OF RANGE 17, WEST OF THE FOURTH PRINCIPAL MERIDIAN, CARLTON COUNTY, MINNESOTA.
 SEE SURVEY FOR FULL LEGAL.

BENCHMARK:
 TOP OF GIN SPIKE IN SOUTH SIDE UTILITY POLE LOCATED IN THE NE QUADRANT OF THE INTERSECTION OF THE HWY. 33 FRONTAGE ROAD AND TALL PINE LANE. BENCH MARK IS SHOWN ON SURVEY. ELEVATION=1207.13 FEET.



SITE PLAN BASED ON SURVEY INFORMATION DATED JANUARY 27, 2017 PROVIDED BY ALTA LAND SURVEY COMPANY.

POND OUTLET CONTROL STRUCTURE (OCS-1)



GENERAL UTILITY NOTES:

- Specifications applicable for this project: Current standard specifications for the City of Cloquet, MN and all Minnesota Department of Health and MPCA requirements except where modified by these contract documents.
- OSHA requirements shall be followed for all work on this project.
- The Contractor shall notify "Gopher State One Call" 48 hours prior to any excavation (651-454-0002 or 1-800-252-1166 out state.)
- The Contractor shall verify all locations and elevations of underground utilities with utility companies prior to any construction (storm sewer, sanitary sewer, water, natural gas, telephone, electric, etc.), and immediately notify the Engineer of any conflicts.
- The Contractor shall protect all existing utilities and facilities to allow proper functioning during and after construction. Any required supporting structures shall be supplied by the Contractor as work incidental to the contract.
- The contractor shall immediately notify the Engineer of any conflicts between existing utilities, and the proposed construction. The Engineer will coordinate with the Utility Company in question to determine the need for relocation of the existing utility.
- Existing conditions such as sand in manholes or valve boxes shall be identified by the Contractor and these shall be reported to the Engineer prior to excavation by the Contractor. Once construction has begun, all damage to underground utilities will be assumed to have been caused by the Contractor, any repairs necessary shall be performed by the Contractor at the Contractor's expense.
- ALTA survey shall govern for easements and lot lines.
- The Contractor shall coordinate with the local jurisdiction to obtain permits and meter for water source. All associated costs shall be incidental to the Contract, including disposal of test water into City's sanitary sewer system. The Contractor shall not operate gate valves or hydrants on the City's water supply system.
- The Contractor shall notify the City Engineer and the Project Engineer 48 hours prior to starting work or as required by the local jurisdiction or be subject to being shut down.
- The Contractor shall keep access roads clear of soil or other debris, and perform daily street cleaning as required by the NPDES permit. Positive drainage, controlled with erosion control and erosion prevention measures as required by the NPDES permit shall be performed. Inlet protection shall be installed within 48 hours after inlet construction. Unless specified on the plans or as a bid item on the Bid Form, any temporary culverts, ditches, filter fabric, etc. necessary to accomplish this shall be performed as incidental to the Contract.
- The Contractor shall preserve and protect the markers and monuments set for the subdivision of the land.
- The Contractor shall schedule the soils engineer to facilitate certification of all controlled fills in a timely fashion. Density tests shall meet the following:
 A. Density tests shall be taken on all trenches at locations as determined by the Engineer or his representative.
 B. Within the upper 3' of streets, private drives and parking lots, Contractor shall utilize approved soils that are within 1% optimum moisture content as defined by the Standard Proctor Test-ASTM: D-698 with 100% Standard Proctor Density and not exceeding compaction by more than 1%. Below the upper 3', compaction shall meet 95%. Grading tolerances shall be 0.1".
- The Owner shall pay for all testing of soils compaction. Any areas which fail to meet the above standards shall be corrected and re-tested by the Owner's testing agent at the Contractor's expense.
- Sanitary service and Water service shall be installed at elevations as defined on this plan (approximate 7.0' bury depth).
- Contractor shall provide temporary traffic control in compliance with MN/DOT "Temporary Traffic Control Zone Layouts Field Manual" dated 2015 for construction adjacent to travel ways.
- Contractor shall be responsible for verification of the depth of existing utilities listed on this plan prior to the ordering of any fittings, structures, castings, etc. Engineer and the Owner shall not be responsible for any discrepancies found as depths are estimated.
- City inspection is required for the sanitary sewer and water service connections.
- Contractor to comply with all regulatory agency permit conditions for permits obtained by owner and for permits obtained by general contractor.
- All work performed and materials used for construction of utilities must conform to the City of Cloquet Standard Specifications and Details.

SHEET INDEX:

C1.0	SITE PLAN
C2.0	GRADING AND DRAINAGE PLAN
C3.0	UTILITY PLAN
C4.0	STORM WATER POLLUTION PREVENTION PLAN
C5.0	EXISTING CONDITIONS PLAN
C6.0	DEMOLITION PLAN
C7.0	LIGHTING PLAN
C8.0	STANDARD DETAILS



1418 HWY. 33 SOUTH CLOQUET, MN 55720

DEVELOPED BY:
BORDER FOODS
 5425 BOONE AVE. N
 NEW HOPE, MINNESOTA 55428

EXPLORER LITE - MEDIUM 40
 XX SEATS / X,XXX S.F.

PROJECT NO.: TB17-01
 DRAWN BY:
 CHECKED BY:
 ISSUES AND REVISIONS:
 CITY REVIEW SUBMITTAL 02/17/2017

UTILITY PLAN

C3.0

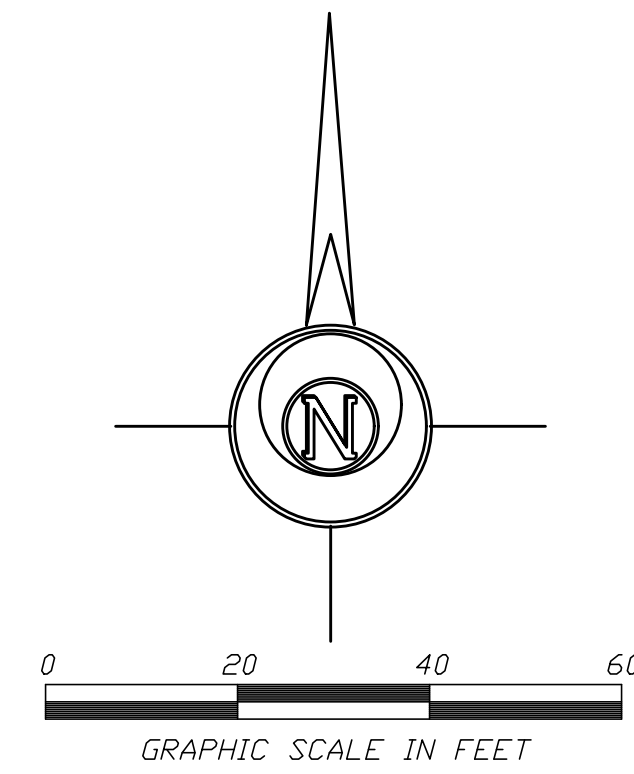
TACO BELL
 FRONTAGE & TALL PINE
 CLOQUET, MN
 PREPARED BY: JOHN BUJAKE
 ACCUSERV LIGHTING & EQUIPMENT
 877-707-7378
 502-961-0357 FAX
 jbujake@accu-serv.com
 FEBRUARY 13, 2017

LEGAL DESCRIPTION:

PART OF THE SE 1/4 OF THE NE 1/4 SECTION 26,
 TOWNSHIP 49, NORTH OF RANGE 17, WEST OF
 THE FOURTH PRINCIPAL MERIDIAN, CARLTON
 COUNTY, MINNESOTA.
 SEE SURVEY FOR FULL LEGAL.

BENCHMARK:

TOP OF GIN SPIKE IN SOUTH SIDE UTILITY POLE
 LOCATED IN THE NE QUADRANT OF THE
 INTERSECTION OF THE HWY. 33 FRONTAGE ROAD
 AND TALL PINE LANE. BENCH MARK IS SHOWN
 ON SURVEY. ELEVATION=1207.13 FEET.

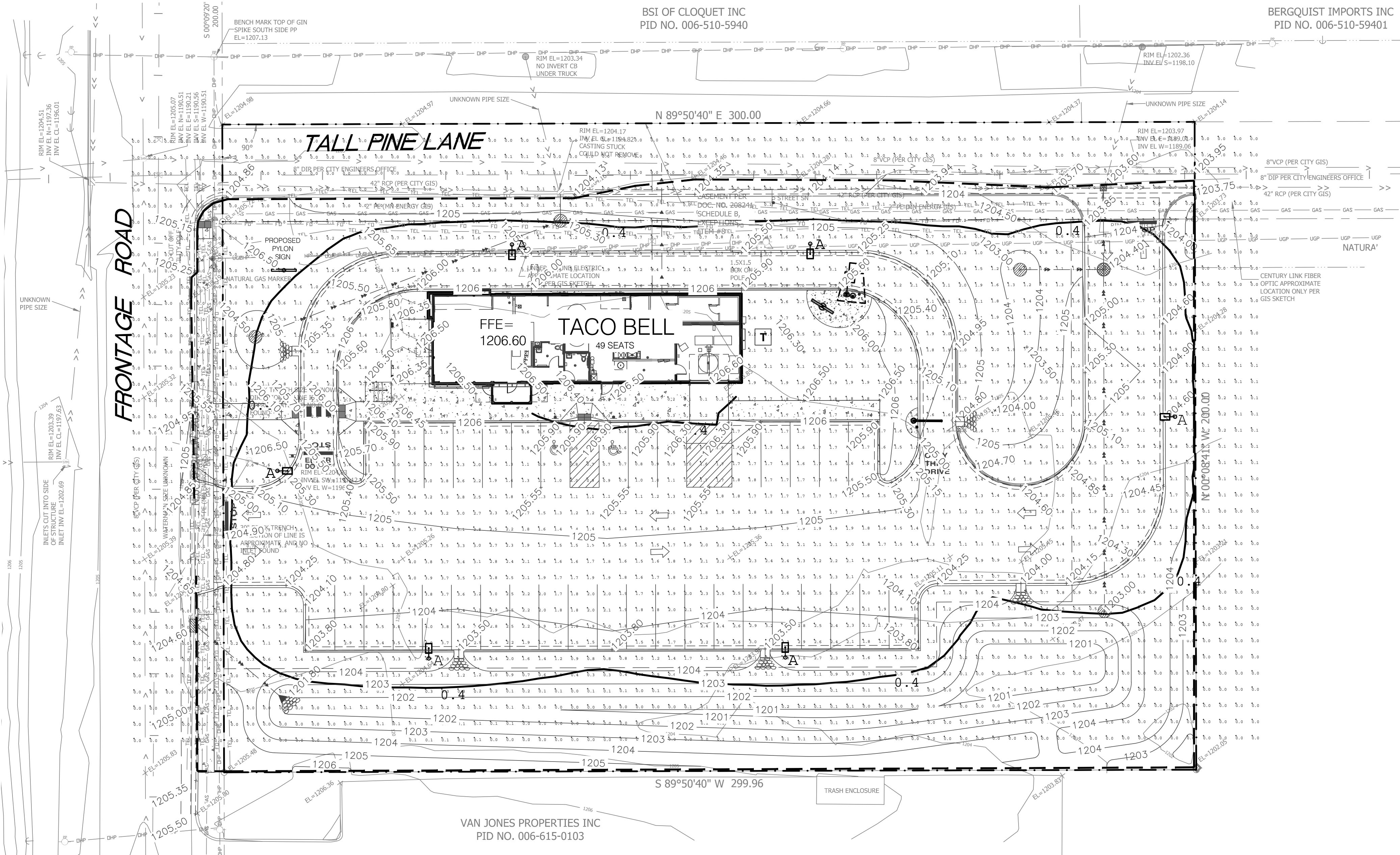


Calculation Summary					
Label	Avg	Max	Min	Avg/Min	Max/Min
EXTENDED	1.09	4.4	0.0	N.A.	N.A.
VEHICULAR SURFACE	2.13	4.2	0.4	5.33	10.50

LIGHT LEVELS ARE MAINTAINED FOOT-CANDLES, INITIAL LEVELS ARE SLIGHTLY HIGHER

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Lum. Lumens	LLF	Lum. Watts	Description
☐	6	A	SINGLE	15195	0.900	211	ECF-4-215LA-641A-NW-UNV-BRP-IS / 4SQB3-S11G-22.5-S-BRZ

LIGHTING RESTRICTIONS: FIXTURES MUST BE FULL CUTOFF
 FIXTURE MOUNTING HEIGHT NOT TO EXCEED 25' A.F.G.
 LIGHT LEVEL AT THE PROPERTY LINE NOT TO EXCEED 0.4 FOOT-CANDLE
 FIXTURES ARE 211W 4000K LED w/ FLAT LENSES AND BACKLIGHT CONTROL
 POLES ARE 22'-6" FOR AN OVERALL FIXTURE MOUNTING HEIGHT OF 25'-0" A.F.G.



Consultant
 SITE CONSTRUCTION PLANS PREPARED BY:
CIVIL ENGINEERING
SITE DESIGN
 118 East Broadway St.
 PO Box 566
 Monticello, Mn 55362
 Phone: 763-314-0929
 www.civiled.com
 I hereby certify that this plan, specification, or
 report was prepared by me or under my direct
 supervision, and that I am a duly Licensed
 Engineer under the laws of the State of
 Minnesota.
Printed Name: SCOTT DAHKE
Signature: *Scott Dahke*
Date: 02/17/17 **License #:** 24348



1418 HWY. 33 SOUTH
 CLOQUET, MN 55720
 DEVELOPED BY:
 BORDER FOODS
 5425 BOONE AVE. N
 NEW HOPE, MINNESOTA 55428

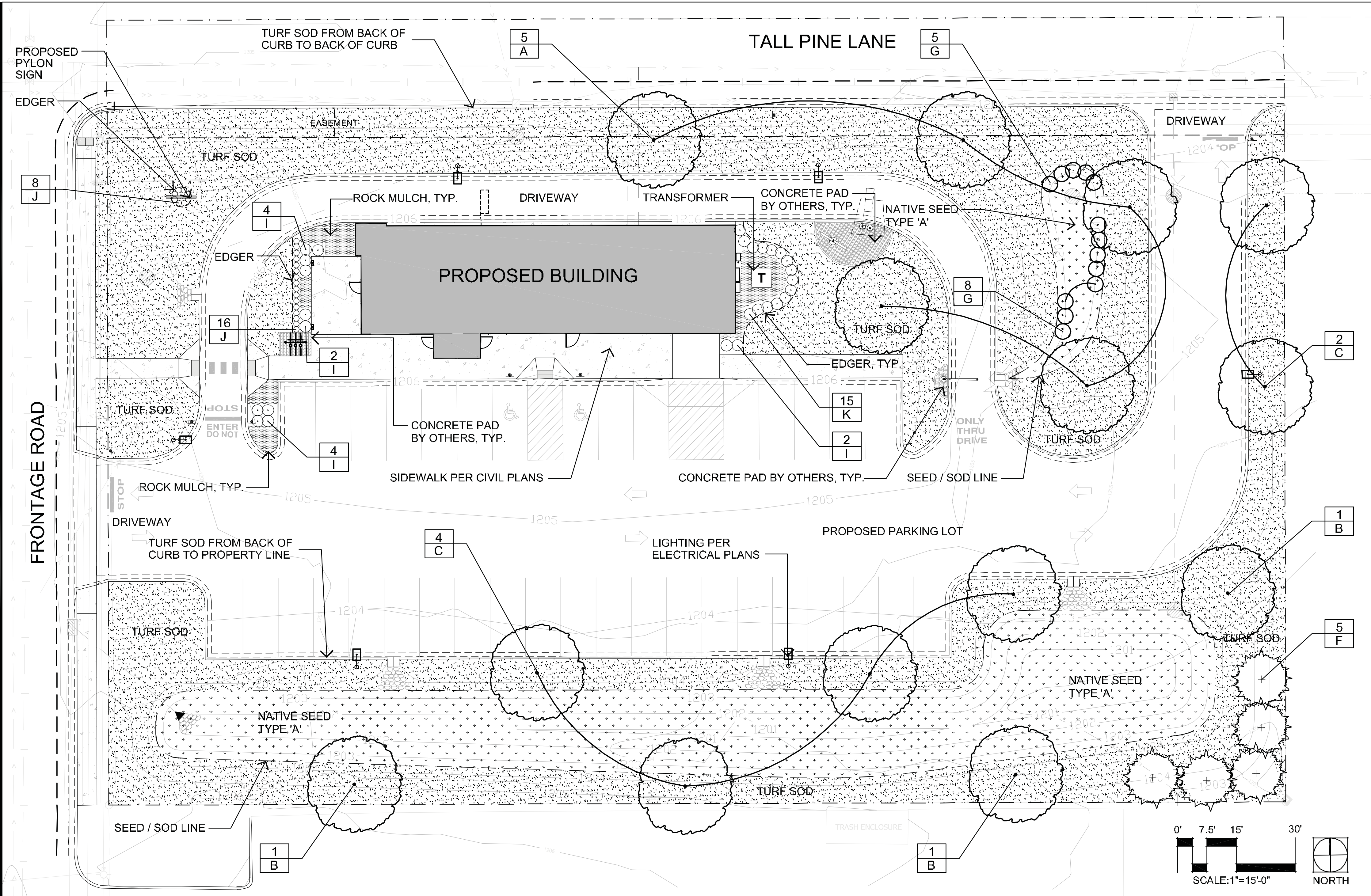
EXPLOLER LITE - MEDIUM 40
 XX SEATS / X,XXX S.F.
 PROJECT NO.: TB17-01
 DRAWN BY:
 CHECKED BY:
 ISSUES AND REVISIONS:
 CITY REVIEW SUBMITTAL 02/17/2017

SHEET INDEX:

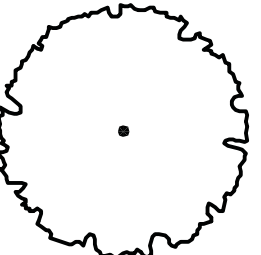
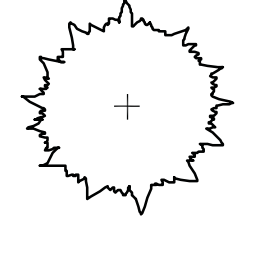
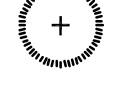

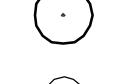

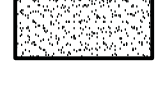
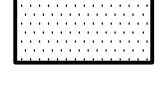
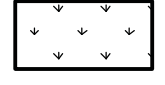
C1.0	SITE PLAN
C2.0	GRADING AND DRAINAGE PLAN
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C8.0	STANDARD DETAILS

LIGHTING PLAN

C7.0



LEGEND:

-  Proposed 2.5" Cal. Deciduous Overstory Tree
-  Proposed 6' Hgt. Coniferous Overstory Tree
-  Proposed 5 gal. Coniferous Shrub
-  Proposed 5 gal. Deciduous Shrub
-  Proposed 2 gal. Deciduous Shrub
-  Proposed 1 gal. Perennial Plant
-  New Irrigated Turf Sod Areas
-  Rock Mulch
-  Type 'A' Seed Mix

- Notes:**
1. Refer to Sheets L2 & L3 for Plant Schedule, Details, Notes, and Requirements.
 2. See Civil Engineer's plans for site plan layout and dimensions.
 3. Contractor to coordinate all work outside the property line with the City of Cloquet Parks Department.
 4. Refer to Sheet L3 for Native Seeding Mixtures and Requirements.



TACO BELL
EXPLORER LITE
MEDIUM 40

1418 HWY. 33 SOUTH
CLOQUET, MN 55720

DEVELOPED BY:
BORDER FOODS
5425 BOONE AVE. N
NEW HOPE, MINNESOTA 55428

EXPLORER LITE - MEDIUM 40
XX SEATS / X,XXX S.F.

PROJECT NO.:	17103
DRAWN BY:	MF
CHECKED BY:	BH
ISSUES AND REVISIONS:	
PRELIMINARY CONCEPT	02.15.2017
CITY REVIEW SUBMITTAL	02.17.2017

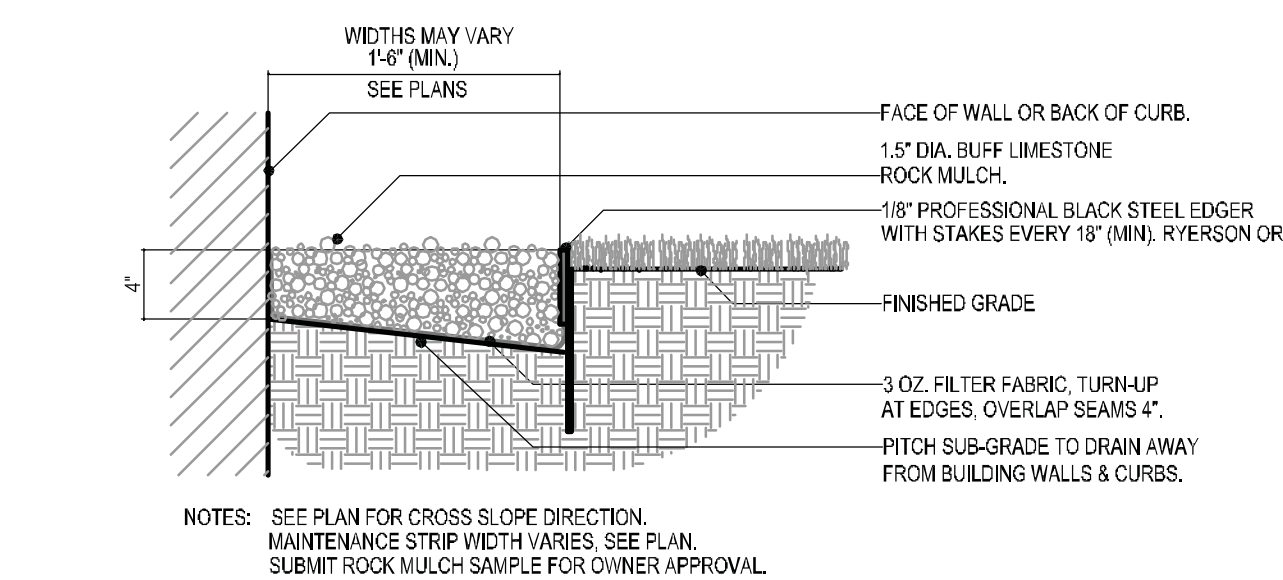
**PRELIMINARY -
NOT FOR
CONSTRUCTION**

Taco Bell
Landscape Plan

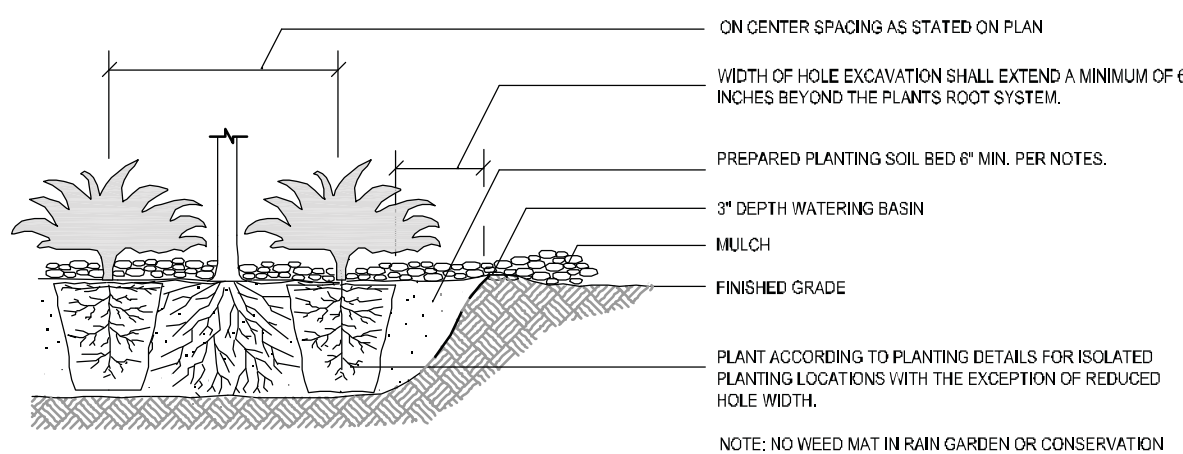
L1

Landscape Notes & Requirements:

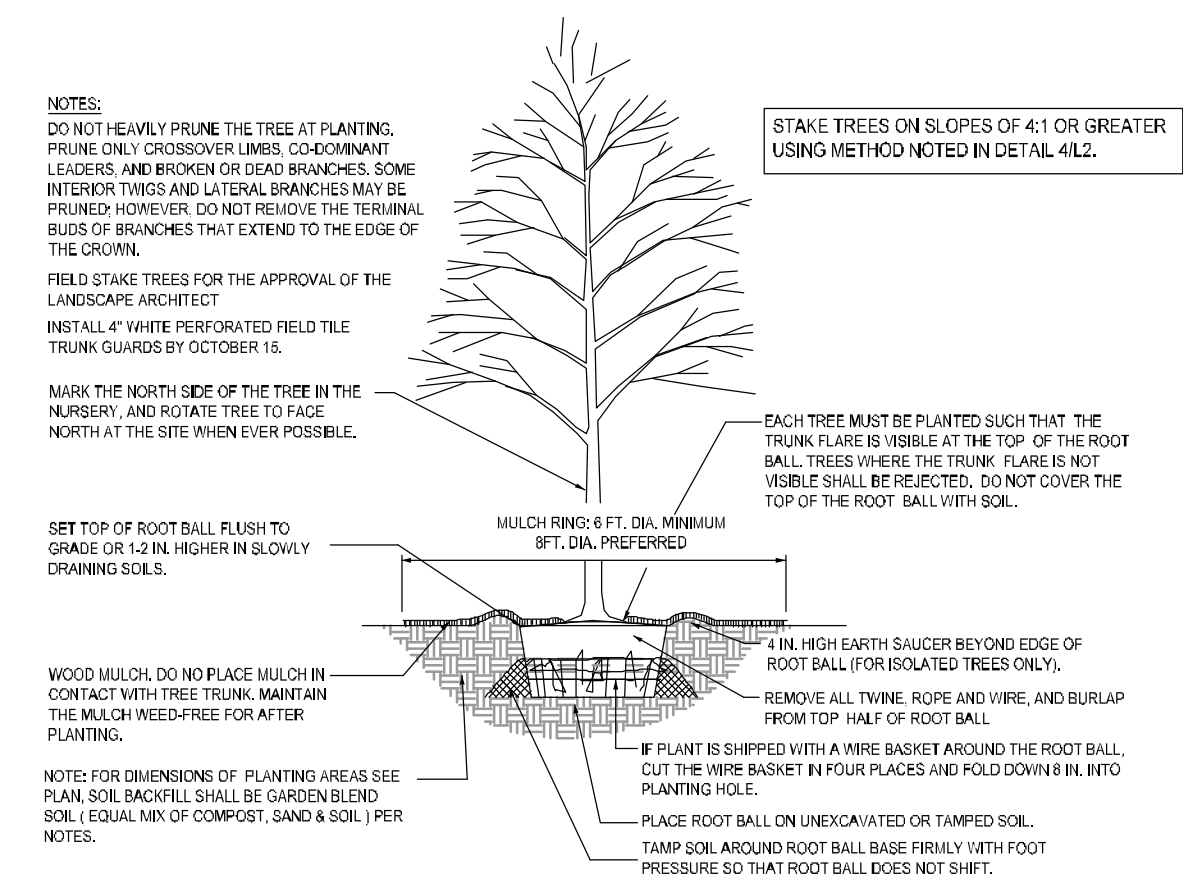
- Tree saucer for individual trees outside of a plant bed to be four inches (4") depth natural single-shred hardwood mulch for trees outside of a plant bed. Install per tree planting detail. Do not place mulch against tree trunk. Remove wire and burlap from top third of root ball before final soil back-fill and mulch.
- Refer to civil plan sheets for grading, drainage, site dimensions, survey, tree removal, proposed utilities & erosion control.
- All plant material shall comply with the latest edition of the American Standard for Nursery Stock, American Association of Nurserymen. Unless noted otherwise, deciduous shrubs shall have at least 5 canes at the specified shrub height. Plant material shall be delivered as specified.
- Plan takes precedence over plant schedule if discrepancies in quantities exist.
- All proposed plants shall be located and staked as shown.
- Adjustment in location of proposed plant material may be needed in field. Should an adjustment be required, the client will provide field approval. Significant changes may require city review and approval.
- The project landscape contractor shall be held responsible for watering and properly handling all plant materials brought on the site both before and after installation. Schedule plant deliveries to coincide with expected installation time within 36 hours.
- All plant materials shall be fertilized upon installation as specified.
- The landscape contractor shall provide the owner with a watering schedule appropriate to the project site conditions and to plant material growth requirements.
- If the landscape contractor is concerned or perceives any deficiencies in the plant selections, soil conditions, drainage or any other site condition that might negatively affect plant establishment, survival or guarantee, they must bring these deficiencies to the attention of the landscape architect & client prior to bid submission. Plant bed drainage concerns during plant installation shall be brought to the attention of the Owner and General Contractor immediately.
- Contractor shall establish to his/ her satisfaction that soil and compaction conditions are adequate to allow for proper drainage at and around the building site.
- Contractor is responsible for ongoing maintenance of all newly installed material until time of owner acceptance. Any acts of vandalism or damage which may occur prior to owner acceptance shall be the responsibility of the contractor. Contractor shall provide the owner with a maintenance program including, but not limited to, pruning, fertilization and disease/pest control.
- The contractor shall guarantee newly planted material through one calendar year from the date of written owner acceptance. Plants that exhibit more than 10% die-back damage shall be replaced at no additional cost to the owner. The contractor shall also provide adequate tree wrap and deer/rodent protection measures for the plantings during the warranty period.
- This layout plan constitutes our understanding of the landscape requirements listed in the ordinance. Changes and modifications may be requested by the city based on applicant information, public input, council decisions, etc.
- The landscape contractor shall be responsible for obtaining any permits and coordinating inspections as required throughout the work process.
- Plant size & species substitutions must be approved in writing prior to acceptance in the field.
- The landscape contractor shall furnish an Irrigation Layout Plan for head-to-head coverage of all tree, turf and shrub planting areas. Use commercial-grade irrigation equipment and provide product cut-sheets and (4) copies of the proposed layout plan to the landscape architect for review and approval prior to installation. Coordinate irrigation connection point, controller, back-flow and valving locations with the mechanical engineer, architect, & general contractor. Include 1 fall shut-down and spring start-up in irrigation bid.
- All edger shall be professional grade 1/8" thick black steel edger. Anchor every 18" on-center (minimum). Submit sample.
- Landscape Contractor is responsible for coordination with the General Contractor, to protect the new improvements on and off-site during landscape work activities. Report any damage to the General Contractor immediately.
- Unless otherwise noted/indicated, plant beds shall receive rock mulch over fabric weed mat, per detail. Submit mulch sample for Owner approval. Do not install weed mat under perennials, with the exception of ornamental grasses.
- Rock mulch areas (all plant beds) shall be 1.5" Buff Limestone rock. Install per detail. Submit mulch sample for approval.
- All planting, seeding, and sodded areas shall be prepared prior to installation activities with a harley power box rake or equal to provide a firm planting bed free of stones, sticks, construction debris, etc.
- Turf Sodding activity shall conform to all rules and regulations as established in the MnDOT Seeding Manual, 2014 edition, for seed bed preparation, installation, maintenance, acceptability, and warranty.
- The Landscape Contractor shall furnish samples of all landscape materials for approval prior to installation.
- The Landscape Contractor shall clear and grub the underbrush from within the work limits to remove dead branches, leaves, trash, weeds and foreign materials.
- The landscape contractor shall contact Gopher State One Call no less than 48 hours before digging for field utility locations.
- The landscape contractor shall be responsible for the removal of erosion control measures once vegetation has been established to the satisfaction of the municipal staff. This includes silt curtain fencing and sediment logs placed in the landscape.
- The landscape contractor shall be responsible for visiting the site to become familiar with the conditions prior to bidding and installation. Coordinate with the general contractors on matters such as fine grading, landscaped area conditions, staging areas, irrigation connection to building, etc.
- See Site and Civil plans for additional information regarding the project, including infiltration area soils and sub-surface drainage requirements and performance.
- Topsoil Requirements: All graded areas of the site that are designated on the plan set for turf sod shall have no less than 6" of imported top soil, areas designated for shrubs, trees, and perennials shall have no less than 12" of imported top soil, meeting MnDOT classifications for planting soil for trees, shrubs, and turf. Slope away from building.
- Landscape contractor must prove the open sub-grade of all planting areas after their excavation is capable of infiltrating a minimum requirement of 1/4-inch of water per hour prior to installation of plant materials, topsoil, irrigation, weed mat, and mulch. Planting areas not capable of meeting this requirement shall have 4" diameter X 48" depth holes augured every 36" on-center and filled with MnDOT Free-Draining Coarse Filter Aggregate. Re-test sub-grade percolation for compliance to infiltration minimum requirement.
- Landscape contractor to provide nursery pull list (bill of lading) including plant species and sizes shipped to the site. Additionally, the landscape contractor shall provide nursery stock traceability, proving none of the materials provided contain or are genetic strains of the neonicotinoid family including acetamiprid, clothianidin, imidacloprid, nitenpyram, nithiazine, thiacloprid and thiamethoxam.



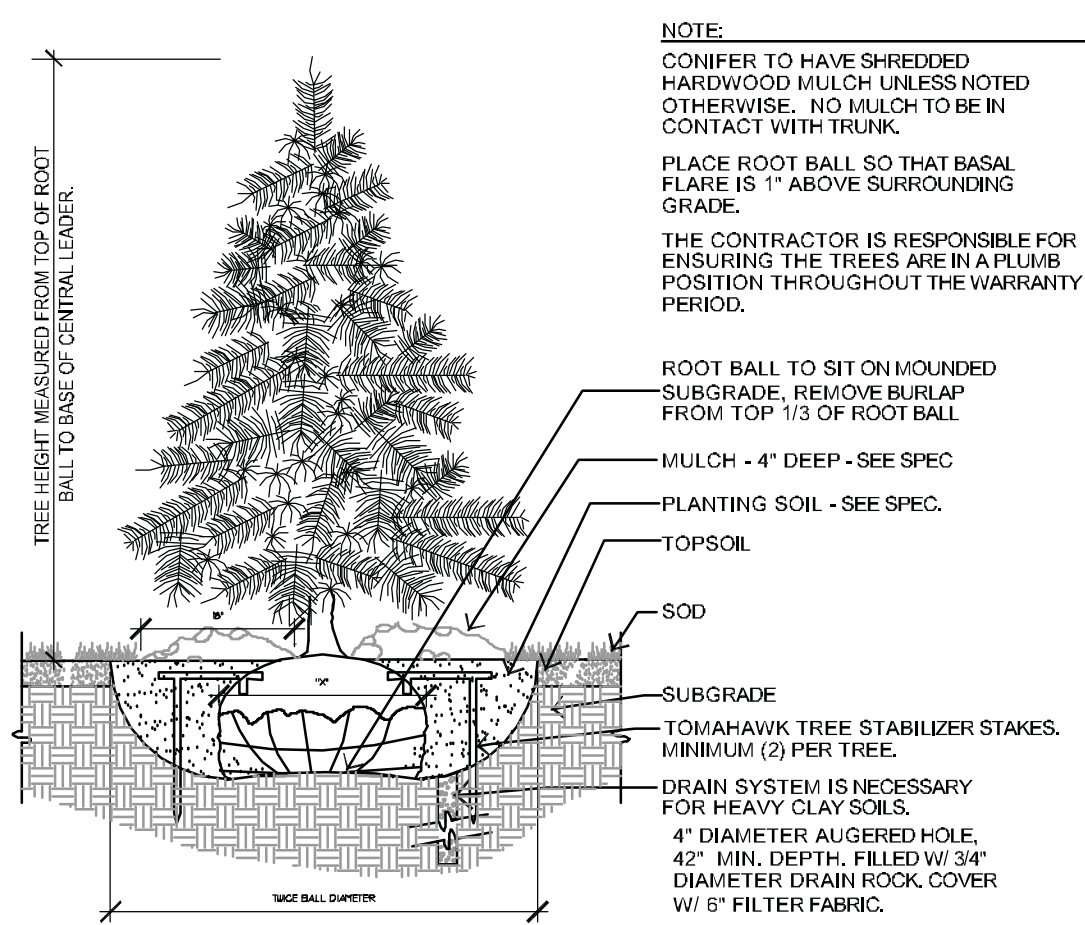
1 ROCK MULCH DETAIL
NOT TO SCALE



2 TYP. SHRUB PLANTING - SECTION
NOT TO SCALE



3 DECIDUOUS TREE PLANTING - SECTION
NOT TO SCALE



4 CONIFEROUS TREE PLANTING - SECTION
NOT TO SCALE

Landscape Planting Palette:

Symbol	Quan.	Scientific Name	Common Name	Size	Root	Notes
A	5	Acer x freemanii 'Sienna Glen'	Sienna Glen Maple	2.5" Cal.	B&B	
B	3	Betula Nigra	River Birch	6' Hgt.	B&B	Clump
C	6	Celtis occidentalis	Hackberry	2.5" Cal.	B&B	

DECIDUOUS OVERSTORY TREES:

Symbol	Quan.	Scientific Name	Common Name	Size	Root	Notes
F	5	Pinus resinosa	Red Pine	6' Hgt.	B&B	Full Form

CONIFEROUS TREES:

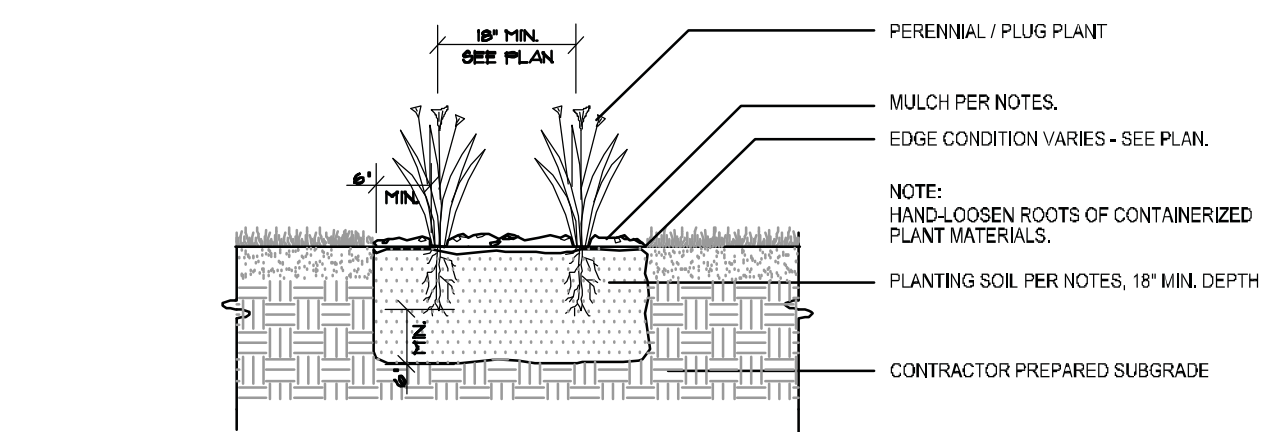
Symbol	Quan.	Scientific Name	Common Name	Size	Root	Notes
G	13	Cornus alba 'Regzam'	Red Gnome Dogwood	#5	POT	

SHRUBS:

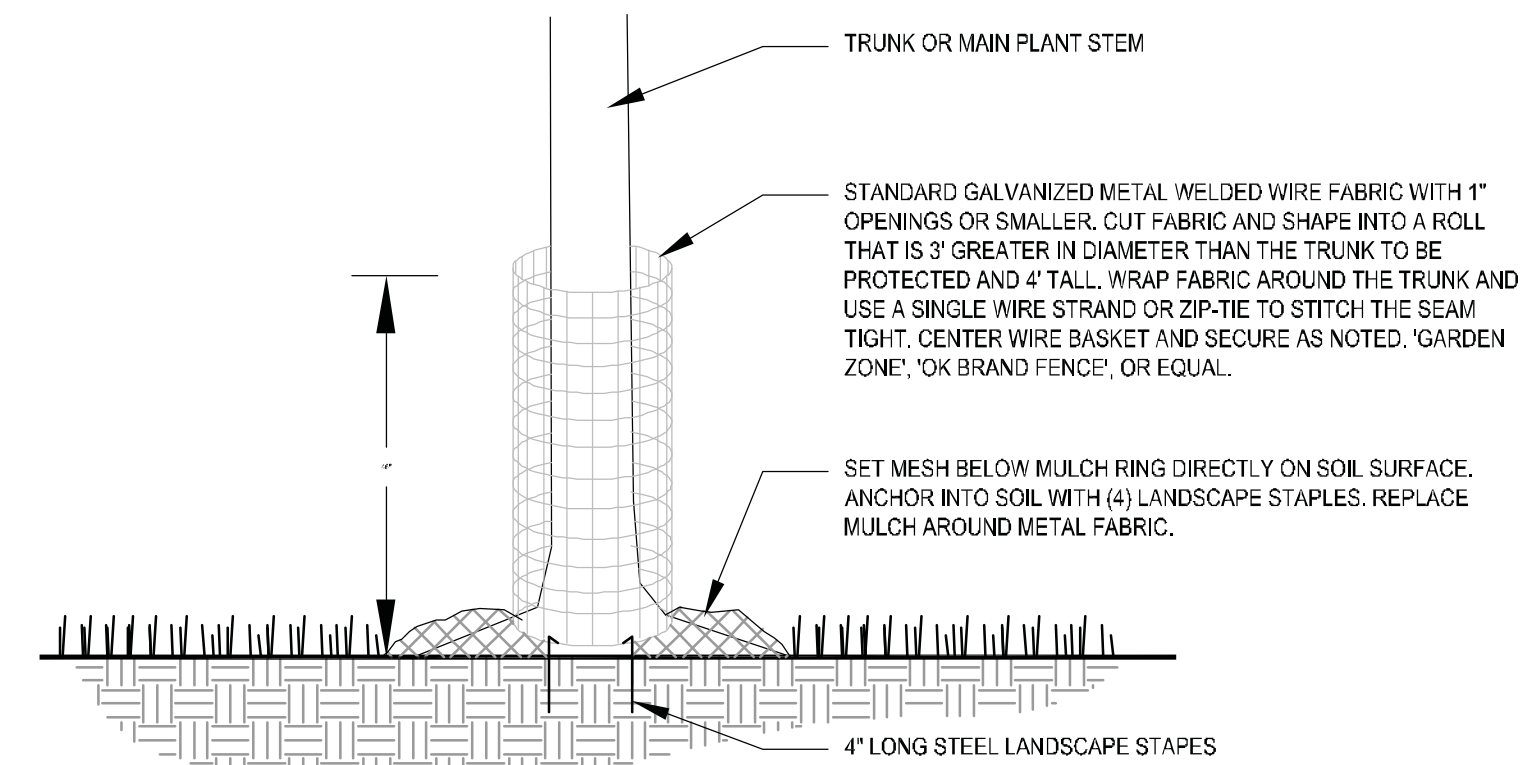
Symbol	Quan.	Scientific Name	Common Name	Size	Root	Notes
I	12	Calamagrostis x acutiflora 'Karl Foerster'	Karl Foerster Feather Reed Grass	#1	POT	12" Min. Height
J	24	Hemerocallis 'Pardon Me'	Daylily 'Pardon Me'	#1	POT	12" Min. Height
K	15	Panicum virgatum 'Northwind'	Northwind Switch Grass	#1	POT	12" Min. Height

PERENNIALS AND GRASSES:

- Required New Overstory Trees: 19
- Total New Overstory Trees: 19
- Total New Shrubs: 13
- Total New Perennials: 51



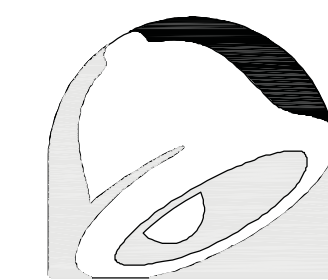
5 TYP. PERENNIAL PLANTING DETAIL
NOT TO SCALE



6 TREE TRUNK DEER & RODENT PROTECTION
NOT TO SCALE

Notes:

1. Refer to Sheet L1 for planting plan.
2. Refer to Sheet L3 for landscape notes and specifications.
3. See Civil Engineer's plans for site plan layout and dimensions.
4. Contractor to coordinate all work outside the property line with the City of Cloquet Parks Department.



TACO BELL

EXPLORER LITE
MEDIUM 40

1418 HWY. 33 SOUTH
CLOQUET, MN 55720

DEVELOPED BY:
BORDER FOODS
5425 BOONE AVE. N
NEW HOPE, MINNESOTA 55428

EXPLORER LITE - MEDIUM 40
XX SEATS / X,XXX S.F.

PROJECT NO.: 17103

DRAWN BY: MF

CHECKED BY: BH

ISSUES AND REVISIONS:

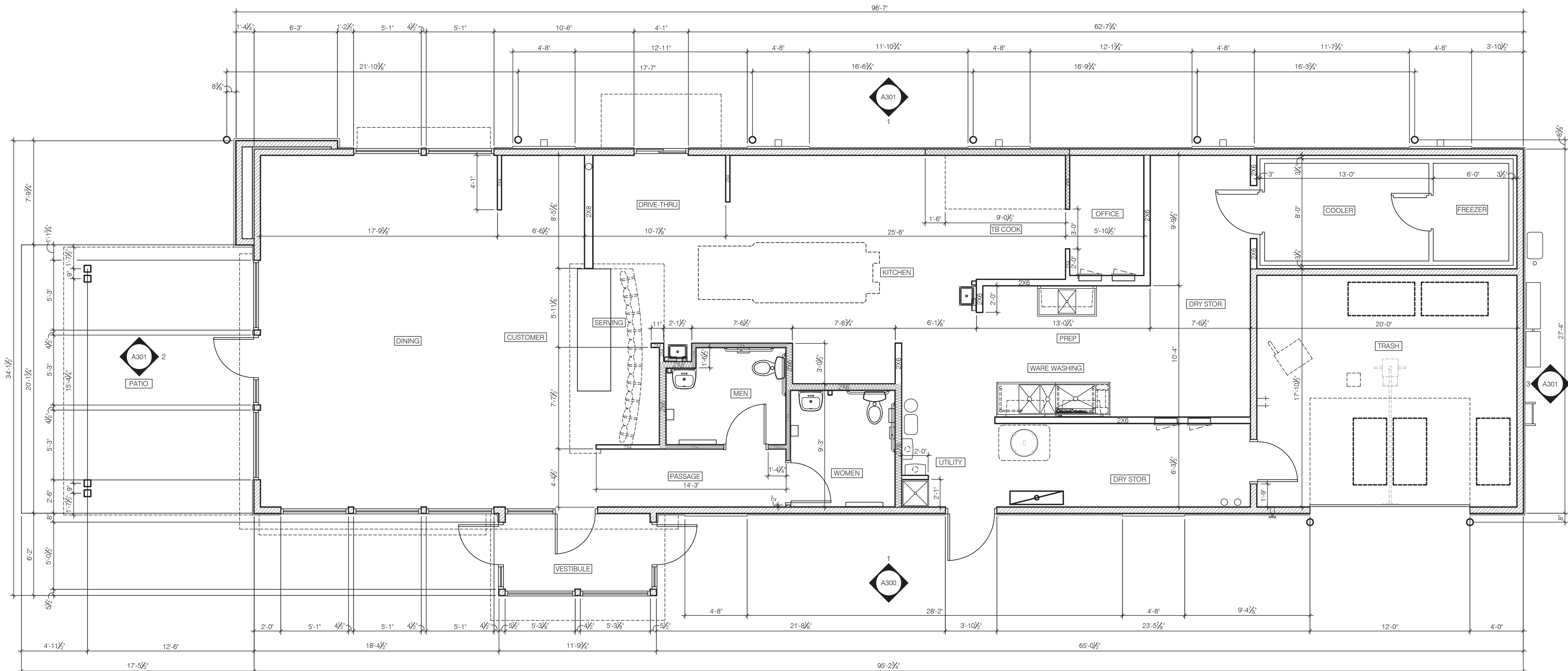
PRELIMINARY CONCEPT 02.15.2017

CITY REVIEW SUBMITTAL 02.17.2017

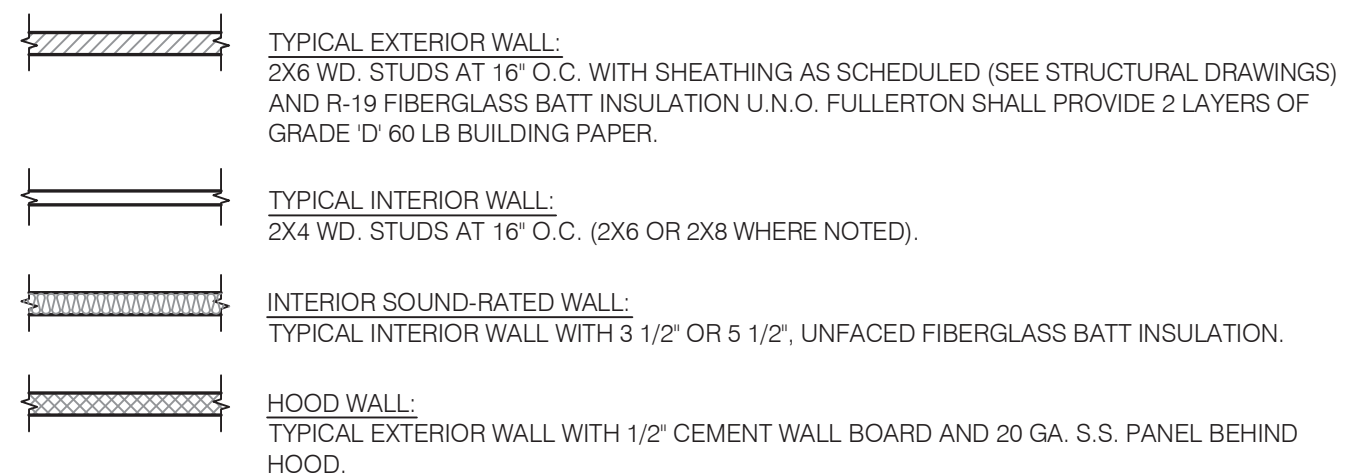
PRELIMINARY - NOT FOR CONSTRUCTION

Taco Bell
Landscape Details

L2



FLOOR PLAN 1/4"=1'-0" **1**



WALL SUBSTRATES: SEE FULLERTON BUILDING SYSTEMS FOR ADDITIONAL INFORMATION

- DINING ROOM:
1/2" GYPSUM WALLBOARD FROM TOP OF SLAB TO 6" ABOVE CEILING HEIGHT U.N.O. SEE 8 & 16/AXXX. (NOTE: 1/2" CEMENT BOARD IS TO BE SUBSTITUTED FOR GYPSUM WALL BOARD FOR THE FIRST 5' A.F.F. FOR BASE TILE APPLICATION. (SEE ELEVATION DRAWING SHEET XXX FOR LOCATIONS)

- KITCHEN WALLS:
1/2" CEMENT WALLBOARD FROM TOP OF SLAB TO 12" A.F.F. 1/2" CDX PLYWOOD WITH F.R.P. SURFACE FINISH FROM 12" A.F.F. TO 6" ABOVE CEILING HEIGHT U.N.O. IF DOUBLE SIDED SHEARWALL PLYWOOD IS SPECIFIED THE PLYWOOD SHALL BE CONTINUOUS FROM SILL PLATE TO TOP PLATE.
1/2" CEMENT WALLBOARD ON METAL STUD WALLS AT HOOD WITH STAINLESS STEEL WALL PANEL LOCATIONS. SEE HOOD WALL LEGEND ABOVE.

- RESTROOM WALLS:
5/8" CEMENT WALLBOARD FROM TOP OF SLAB TO TOP OF CERAMIC WALL TILE FINISH, WITH 5/8" HI-IMPACT BRAND XP WALLBOARD, TYPE X CORE FROM TOP OF CEMENT BOARD TO 6" ABOVE CEILING HEIGHT U.N.O. (SEE RESTROOM ELEVATIONS FOR HEIGHTS AND LOCATIONS) NO SUBSTITUTIONS ALLOWED. FINISH AS SCHEDULED.

- TRASH ROOM WALLS:
FIRE RATED WALLS TO RECEIVE FULL HEIGHT GYPSUM WALLBOARD ALL OTHER WALLS TO RECEIVE 1/2" PLYWOOD FROM FINISHED FLOOR TO 4'-0" A.F.F. THEN 1/2" GYPSUM WALLBOARD FROM PLYWOOD TO CEILING. FIRE RATED WALLS TO RECEIVE 1/2" PLYWOOD OVER GYPSUM WALLBOARD AND ALL WALLS TO RECEIVE WHITE F.R.P. FROM FINISHED FLOOR TO 4'-0" A.F.F. WITH HORIZONTAL F.R.P. TRIM CAP.
- ALL OTHER FRAME WALL CONDITIONS.
1/2" CEMENT WALLBOARD FROM TOP OF SLAB TO HEIGHT OF CERAMIC TILE FINISH, WITH 1/2" GYPSUM WALLBOARD FROM TOP OF CEMENT BOARD TO 6" ABOVE CEILING HEIGHT U.N.O. FINISH AS SCHEDULED.

WALL LEGEND **2**

DIMENSIONS:

- ALL DIMENSIONS ARE TO FACE OF STUD U.N.O. REFER TO FOUNDATION PLAN FOR FACE OF CONCRETE DIMENSIONS.
- DIMENSIONS NOTED AS "CLEAR" OR "HOLD" ARE MINIMUM REQUIRED NET CLEARANCE FROM FACE OF WALL / WAINSCOT FINISH. VERIFY FINAL EQUIPMENT SIZES WITH VENDOR PRIOR TO INTERIOR WALL FRAMING.

WINDOWS / DOORS:

- SEE SHEET XXXX FOR WINDOW TYPES AND DOOR SCHEDULE.
- ALL DOOR AND WINDOW OPENING DIMENSIONS ARE TO ROUGH OPENINGS.

FINISH SUBSTRATES:

- PROVIDE 1/2" THICK CEMENT WALL BOARD, FROM FLOOR SLAB TO 12" A.F.F. MINIMUM IN LIEU OF GYPSUM WALLBOARD AT WALLS EXCEPT SHEARWALL SURFACES, U.N.O.
- ALL JOINTS, GAPS OR SPACES LEADING TO ALL HOLLOW OR INACCESSIBLE SPACES SHALL BE SEALED WITH "NSF INTERNATIONAL" APPROVED SEALANTS.
- ALL BACK OF HOUSE AND OFFICE WALLS SHALL HAVE 1/2" CDX PLYWOOD SUBSTRATE, U.N.O.

DECOR:

- SEE XXXX FOR SEATING PLAN AND DETAILS.
- SEE XXXX FOR FLOOR FINISHES.
- SEE XXXX AND XXXX FOR WALL FINISHES.
- SEE XXXX FOR CEILING FINISHES.

GENERAL:

- FULLERTON BUILDING SYSTEMS TO ENSURE THAT ALL NAIL / SCREW FASTENING POINTS ARE CLIPPED OFF / REMOVED WITHIN WALL CAVITY PRIOR TO INSTALL OF WALL INSUL. AND VAPOR BARRIER. G.C. TO COORDINATE.
- FULLERTON BUILDING SYSTEMS TO ENSURE ALL "L" ROOF TRUSS CLIPS AND FASTENERS ARE INSTALLED CORRECTLY WITHIN THEIR RESPECTIVE CLIP SLOTS. G.C. TO COORDINATE.
- G.C. TO PROVIDE UNFACED FIBERGLASS BATT INSULATION R-19 WITH POLY VAPOR BARRIER AT EXTERIOR WALL STUD CAVITY. TAP AND SEAL ALL VAPOR BARRIER SEAMS.
- OWNER TO PROVIDE THREE FIRE EXTINGUISHERS - (2) 10 LB. ABC AND (1) K CLASS - TO COMPLY WITH LOCAL FIRE CODE. LOCATE PER DIRECTION OF FIRE MARSHALL OR LOCAL AUTHORIZING AGENT.
- THESE PENETRATIONS ARE BASED UPON WOOD FRAMING. UTILIZATION OF METAL STUDS ON NON-BEARING INTERIOR PARTITIONS, BULKHEADS AND SOFFITS IS ACCEPTABLE.
- ALL PENETRATIONS THROUGH WALLS & CEILINGS SHALL BE SEALED USING MFRS. APPROVED METHOD.
- ALL WALL AND CEILING PENETRATIONS IN TRASH ROOM TO BE SEALED WITH A FIRE RATED SEALANT.
- PAINT ALL EXTERIOR EXPOSED PIPING TO MATCH ADJACENT WALL.
- PROVIDE 2" RIGID INSULATION R-10 WITH 1/2" BILDRITE PROTECTION BOARD ON EXTERIOR FACE OF RIGID INSULATION ON THE FOUNDATION, FROM TOP OF FOOTING TO TOP OF FOUNDATION CONTINUOUSLY AROUND PERIMETER OF FOUNDATION.

FLOOR PLAN NOTES **3**

1 XXXX

FLOOR PLAN KEY NOTES **4**

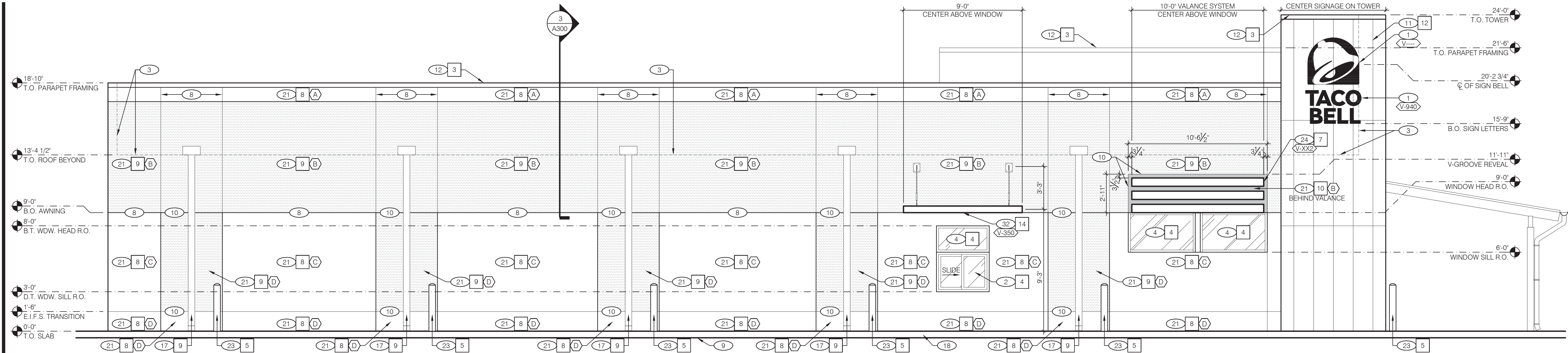


DEVELOPED BY:
BORDER FOODS
5425 BOONE AVE. N
NEW HOPE, MINNESOTA 55428

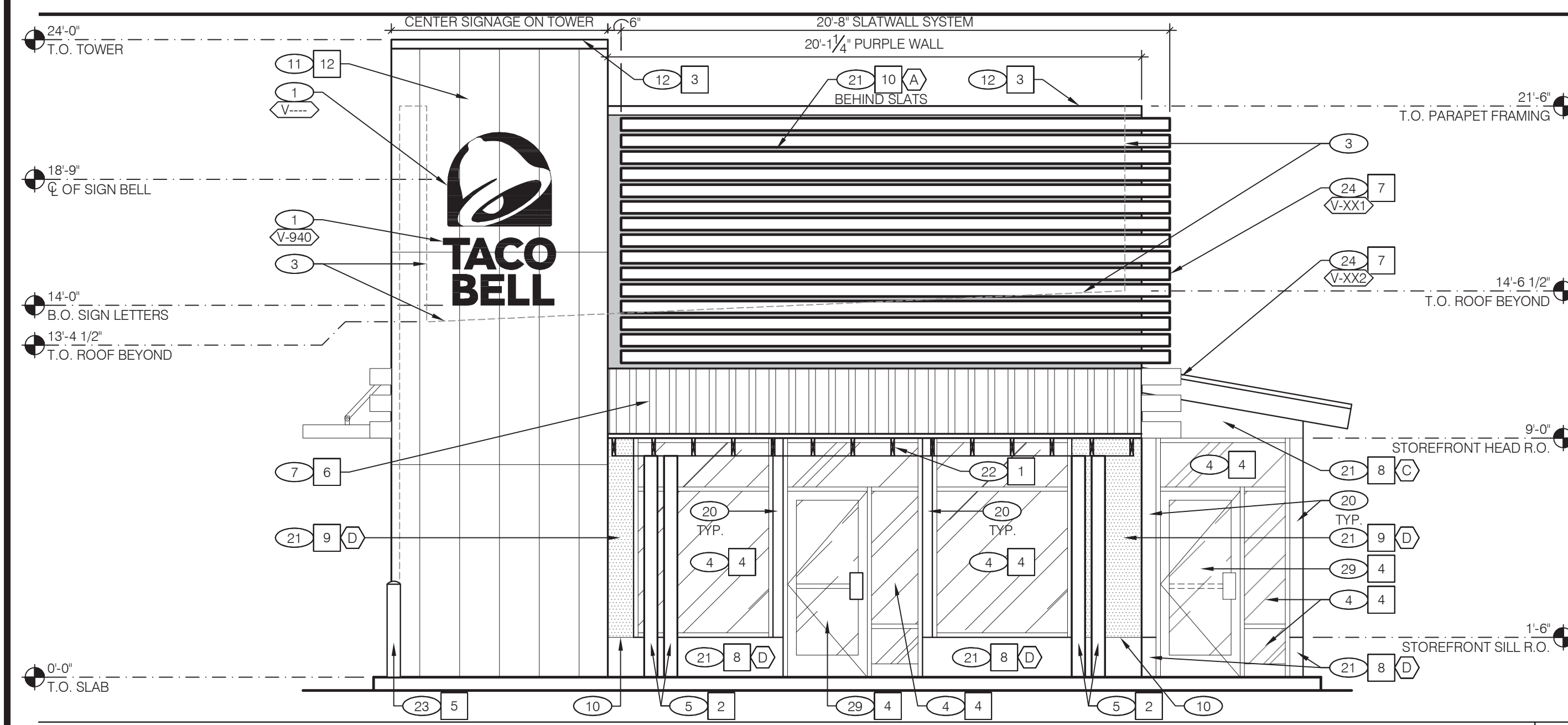
EXPLOER LITE - MEDIUM 40
40 SEATS / 2,701 S.F.

PROJECT NO.: TB17-01
DRAWN BY: KDI / MWH
CHECKED BY: RLO / GGD
ISSUES AND REVISIONS:
CITY REVIEW SUBMITTAL 02.17.2017

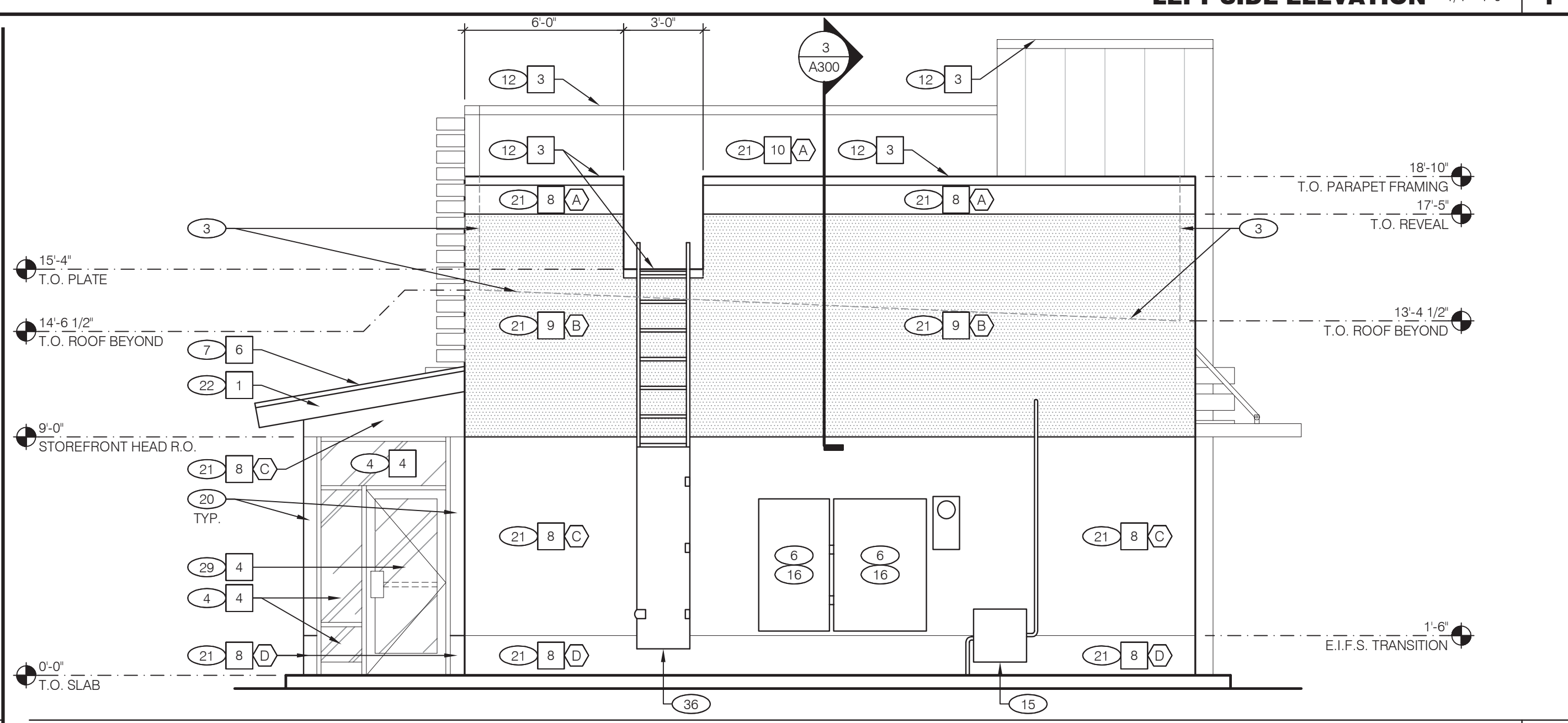
PRELIMINARY - NOT FOR CONSTRUCTION



LEFT SIDE ELEVATION 1/4"=1'-0" 1



FRONT SIDE ELEVATION 1/4"=1'-0" 2



REAR SIDE ELEVATION 1/4"=1'-0" 3

SYMBOL	AREA	MANUFACTURER	COLOR	CONTACT INFORMATION
1	CANOPY RAFTER/ BEAM PAINT	SHERWIN WILLIAMS	SW3022 'WOODSCAPES BLACK ALDER'	SHERWIN WILLIAMS: BRAD HARRINGTON, 216-228-5558 X115 (PHONE), BRAD.E.HARRINGTON@SHERWIN.COM (EMAIL)
2	CANOPY COLUMN PAINT	SHERWIN WILLIAMS	SW 7062 'ROCK BOTTOM'	
3	PARAPET CAP	FIRESTONE UNICLAD	DARK BRONZE SF	
4	STOREFRONT WINDOWS	TBD	CLEAR ANODIZED ALUMINUM	
5	PIPE BOLLARDS	STREET SMART	YELLOW - 1/4" THICK PLASTIC COVER (US.POSTMAN.COM) OR EQUAL	
6	PATIO AND VESTIBULE ROOF	BERRIDGE	S-DECK PREWEATHERED GALVALUME	
7	SLAT WALL AND VALANCE COLOR	VENDOR	SW 7034 'STATUS BRONZE' (EQUAL)	
8	MAIN BUILDING COLOR (EIFS)	SHERWIN WILLIAMS	SW 7067 'CITYSCAPE' (GRAY)	SHERWIN WILLIAMS: BRAD HARRINGTON, 216-228-5558 X115 (PHONE), BRAD.E.HARRINGTON@SHERWIN.COM (EMAIL)
9	ACCENT COLOR (EIFS)	SHERWIN WILLIAMS	SW 6098 'PACER WHITE' (WHITE)	EIFS CONTACT: STO CORP.: CHUCK DUFFIN, 940-894-2092 (PHONE), 940-894-2095 (FAX) CDUFFIN@STOCORP.COM (EMAIL)
10	WALL COLOR BEHIND SCREEN WALL (EIFS)	SHERWIN WILLIAMS	SW 6831 'CLEMATIS' (PURPLE)	
11	NOT USED	-	-	
12	METAL PANELS	WESTERN STATES METAL ROOFING	18" A606-4 RUSTWALL PANELS	
13	NOT USED	-	-	
14	CANOPY COLOR	VENDOR	SW 7034 'STATUS BRONZE' (EQUAL)	

EXTERIOR FINISH SCHEDULE 4

- (A) BASE THICKNESS - 1" THICK E.I.F.S.
 (B) BASE THICKNESS - 2" THICK E.I.F.S.
 (C) BASE THICKNESS - 1" THICK E.I.F.S. WITH HIGH IMPACT MESH (ONLY WHERE NOTED). SEE DETAIL X/AXXX.
 (D) BASE THICKNESS - 2" THICK E.I.F.S. WITH HIGH IMPACT MESH (ONLY WHERE NOTED). SEE DETAIL X/AXXX.

E.I.F.S. 5

- (1) BUILDING SIGN, BY VENDOR. REQUIRES ELECTRICAL. SEE ELECTRICAL PLANS.
 (2) DRIVE-THRU WINDOW. SEE SHEET AXXX AND AXXX.
 (3) DASHED LINE INDICATES ROOF BEYOND.
 (4) STOREFRONT, TYPICAL.
 (5) TUBE STEEL POST BY G.C., SEE STRUCTURAL.
 (6) SWITCH GEAR. PAINT TO MATCH WALL.
 (7) CORRUGATED METAL ROOF SYSTEM PROVIDED BY FULLERTON.
 (8) FULLERTON PANEL JOINT, WITH BACKER ROD AND SEALANT TO MATCH FINISH.
 (9) ASSUME DRIVE-THRU LANE SURFACE IS 6" BELOW THE FINISH FLOOR. REFER TO GRADING AND SITE PLAN.
 (10) 1/2"W X 1/2"D V-GROOVE REVEAL.
 (11) TOWER WITH METAL PANEL FINISH PROVIDED BY FULLERTON.
 (12) PREFINISH PARAPET COPING.
 (13) CO2 FILLER VALVE AND COVER. SEE DETAIL X/AXXX SIMILAR.
 (14) EMERGENCY LIGHT / ALARM FOR FIRE SUPPRESSION SYSTEM.
 (15) GAS SERVICE. DO NOT PAINT.
 (16) WALL SHALL BE FINISHED PRIOR TO INSTALLATION OF SWITCHGEAR.
 (17) SCUPPER, COLLECTOR, AND OPEN FACE DOWNSPOUT. PAINT TO MATCH ADJACENT WALL. PAINT TO MATCH ADJACENT WALL.
 (18) CONCRETE CURB.
 (19) MECHANICAL EQUIPMENT BEYOND.
 (20) BREAK METAL COVER OVER WOOD STUDS TO MATCH STOREFRONT. SEE X/AXXX.
 (21) E.I.F.S. (TYPICAL). SEE X AND X/AXXX.
 (22) WOOD RAFTERS BY FULLERTON. SEE FULLERTON'S STRUCTURAL DRAWINGS.
 (23) BOLLARD, SEE DETAIL X/AXXX.
 (24) SALT / VALANCE BY VENDOR.
 (25) WALL PACK LIGHT FIXTURE. SEE ELECTRICAL DRAWINGS.
 (26) WOOD HEADER BEAM BY FULLERTON. SEE FULLERTON'S STRUCTURAL DRAWINGS.
 (27) FIRE DEPARTMENT SIAMESE CONNECTION AND RELIEF VALVE. DO NOT PAINT.

- (28) FIRE DEPARTMENT KNOX BOX.
 (29) STOREFRONT DOOR. REFER TO DOOR SCHEDULE.
 (30) HOSE BIBB LOCATION. REFER TO PLUMBING AND DETAIL X/AXXX.
 (31) GUTTER AND DOWNSPOUT. PAINT TO MATCH COLUMN.
 (32) DRIVE-THRU CANOPY BY VENDOR.
 (33) EMERGENCY LIGHT FIXTURE WITH BATTERY BACK UP. SEE ELECTRICAL DRAWINGS.
 (34) INSULATED COMMERCIAL GRADE HEAVY DUTY 20 GAUGE STEEL SECTIONAL OVERHEAD DOOR WITH EMBOSSED FRAY EXTERIOR FINISH. 20 GAUGE END AND CENTER STILES. 20 GAUGE STEEL BACK COVER COLOR WHITE. STANDARD MOUNTING AND 2" TRACK. STANDARD SPRINGS. WEATHERSTRIPPING. ELECTRONIC OPERATOR TO INCLUDE 2 BOTTOM EDGE SENSORS. EXTERIOR KEYPAD AND INTERIOR OPEN / CLOSE BUTTON. PROVIDE BENT STEEL ANGLES AT DOOR. PAINT TO MATCH DOOR.
 (35) INSULATED HOLLOW METAL DOOR AND FRAME. PAINT WHITE TO MATCH WALL.
 (36) ALUMINUM ROOF ACCESS LADDER AND DOOR. (DO NOT PAINT) SEE DETAILS X, X AND X/AXXX.

EXTERIOR ELEVATION KEY NOTES 6

finn daniels
 ARCHITECTS
 2145 Ford Parkway, Suite 301
 Saint Paul, Minnesota 55116
 651.690.5525
 www.finn-daniels.com

TACO BELL
 EXPLORER LITE
 MEDIUM 40
 1418 HWY. 33 SOUTH
 CLOQUET, MN 55720
 DEVELOPED BY:
 BORDER FOODS
 5425 BOONE AVE. N
 NEW HOPE, MINNESOTA 55428
 EXPLORER LITE - MEDIUM 40
 40 SEATS / 2,701 S.F.

PROJECT NO: TB17-01
 DRAWN BY: KDI / MWH
 CHECKED BY: RLO / GGD
 ISSUES AND REVISIONS:
 CITY REVIEW SUBMITTAL 02.17.2017

PRELIMINARY - NOT FOR CONSTRUCTION

EXTERIOR ELEVATIONS

A301



Perspective 1

01.25.2017

finn daniels
ARCHITECTS

Cloquet
1418 Highway 33
Cloquet, Minnesota





Perspective 2

01.25.2017



Perspective 3

01.25.2017

finn daniels
ARCHITECTS

Cloquet
1418 Highway 33
Cloquet, Minnesota





Perspective 4

01.25.2017

finn daniels
ARCHITECTS

Cloquet
1418 Highway 33
Cloquet, Minnesota





GENERAL SPECIFICATIONS:

Extruded aluminum cabinet & retainers w/ Black finish
Internally illuminated w/ white LEDs

COLORS:

Dark Purple PMS 2603
Light Purple PMS 2577
Black
White

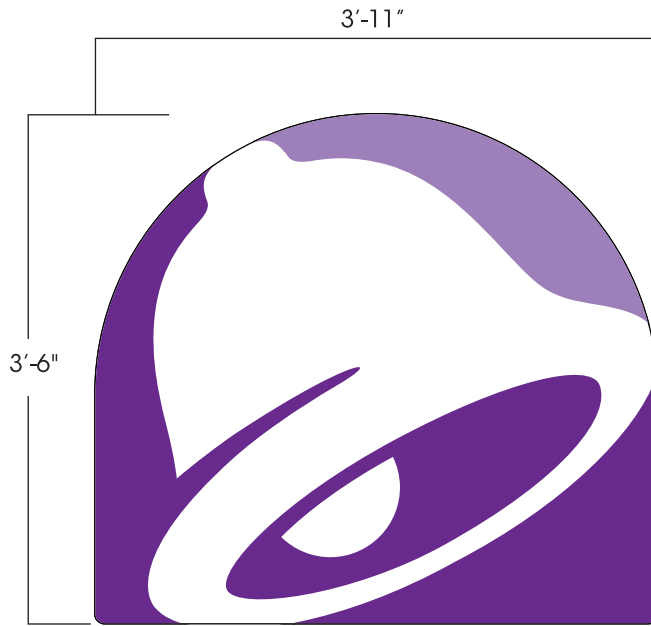
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Everbrite LLC
4949 S 110th Street, Greenfield, WI 53220
Phone: 414-529-3500 • Fax: 414-529-7191
Website: www.everbrite.com

Part No:	Project No: 350969-1
Description: 93 Sq. Ft. Main ID Sign / Breakfast	Date: 9/7/16
	Drawn By: RB





Sign Area: 13.8 Sq. Ft. (Squared)

GENERAL SPECIFICATIONS:

3" aluminum returns & trim cap w/ black finish
Internally illuminated w/ white LEDs

COLORS:

Dark Purple PMS 2603
Light Purple PMS 2577
Black
White

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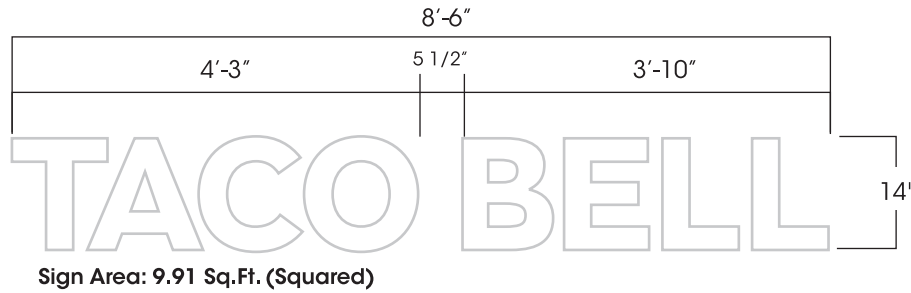


Everbrite LLC
4949 S 110th Street, Greenfield, WI 53220
Phone: 414-529-3500 • Fax: 414-529-7191
Website: www.everbrite.com

Part No: E008079
Description:
3'-6" x 3'-11" Single Face Bell Logo

Project No: 350970-1
Date: 9/6/16
Drawn By: RB



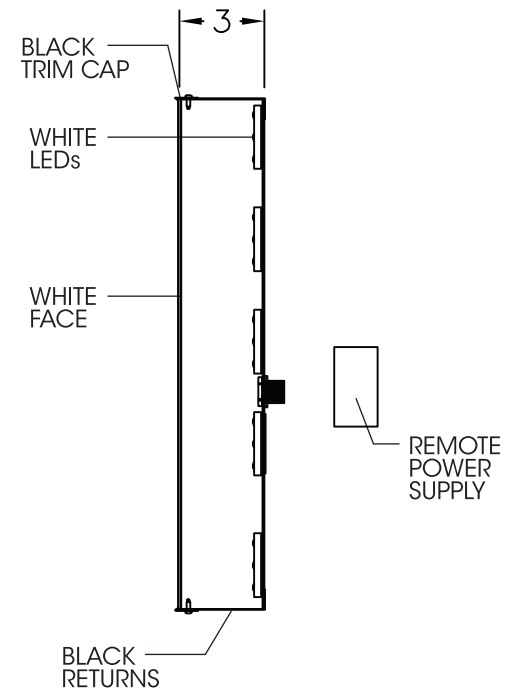
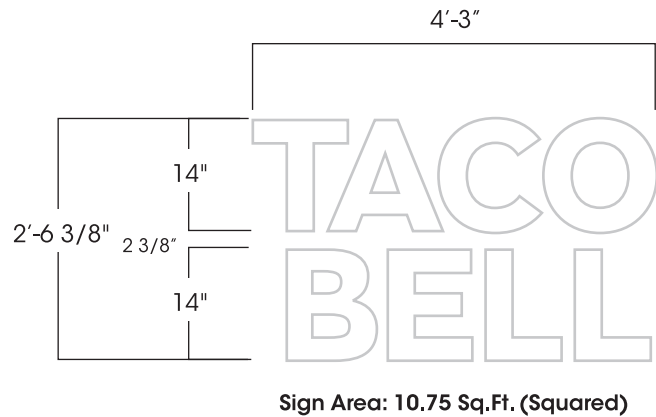


GENERAL SPECIFICATIONS:

3" aluminum returns & trim cap w/ black finish
 Internally illuminated w/ Agilight Pro 160-65k white LEDs

COLORS:

White Faces



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Everbrite LLC
 4949 S 110th Street, Greenfield, WI 53220
 Phone: 414-529-3500 • Fax: 414-529-7191
 Website: www.everbrite.com

Part No: E008191
 Description:
 14" Channel Letter Set

V-940

Project No: 350970-1
 Date: 11/2/16
 Drawn By: RB





Community Development Department

1307 Cloquet Avenue • Cloquet MN 55720
Phone: 218-879-2507 • Fax: 218-879-6555

To: Planning Commission
From: Al Cottingham, City Planner/Zoning Administrator
Date: March 8, 2017

ITEM DESCRIPTION: Breweries, Taprooms, Brew Pubs and Micro Distilleries

Attached are pages from the City Code with the definitions of the different operations. Also attached are the pages from the State Statutes on these same items. Staff would propose adding these definitions to the Zoning Ordinance and then having the different operations as a permitted use in the HC – Historic Commercial, CC – City Center, LI – Light Industry and the OM – Office/Manufacturing Districts.

SECTION 6.2: ALCOHOLIC BEVERAGE LICENSES

6.2.01 Adoption of State Law by Reference. The provisions of Minnesota Statutes, Chapter 340A, as they may be amended from time to time, with reference to the definition of terms, conditions of operation, restrictions on consumption, provisions relating to sales, hours of sale, and all other matters pertaining to the retail sale, distribution, and consumption of intoxicating liquor and 3.2 percent malt liquor are hereby adopted by reference and are made a part of this Code as if set out in full. It is the intention of the City Council that all future amendments to Minnesota Statutes, Chapter 340A are hereby adopted by reference or referenced as if they had been in existence at the time this Code is adopted.

6.2.02 City May Be More Restrictive Than State Law. The Council is authorized by the provisions of Minnesota Statutes, Chapter 340A.509, as it may be amended from time to time, to impose, and has imposed in this Code, additional restrictions on the sale and possession of alcoholic beverages within its limits beyond those contained in Minnesota Statutes, Chapter 340A, as it may be amended from time to time.

6.2.03 Definitions. In addition to the definitions contained in Minnesota Statutes, Chapter 340A.101, as it may be amended from time to time, the following terms are defined for purposes of this ordinance:

- A. **Brewer.** Means a person who manufactures malt liquor for sale and who holds a Brewers License issued by the State of Minnesota.
- B. **Brewery Taproom (also known as a microbrewery).** Means a facility on the premises of or adjacent to the premises owned by a Brewer, licensed under Minn. Stat. 340A.301, intended for the on-sale consumption and limited off-sale of beer produced on site by the brewer as authorized by Minn. Stat. 340A.26.
- C. **Brew Pub.** Means a brewer who also holds one or more retail on-sale license(s) and who manufactures fewer than 3,500 barrels of malt liquor in a year, at any one licensed premises, the entire production of which is solely for consumption on tap on any licensed premises owned by the brewer, or for off-sale from those licensed premises as permitted in Minn. Stat. 340A.24.
- D. **Caterer's Permit.** Means a permit issued by the Commissioner of Public Safety and the City of Cloquet to a restaurant that holds an on-sale intoxicating liquor license issued by the City. The holder of a caterer's permit may sell intoxicating liquor as an incidental part of a food service that serves prepared meals at a place other than the premises for which the holder's on-sale intoxicating liquor license is issued.
- E. **Club.** Means an incorporated organization organized under the laws of the state for civic, fraternal, social, or business purposes, for intellectual improvement, or for the promotion of sports or a congressionally chartered veterans' organization. In addition, the club must meet the following criteria:
 - 1. Has more than 30 members;
 - 2. Own or rent a building or space in a building for more than one year that is suitable and adequate for the accommodation of its members;
 - 3. Is directed by a board of directors, executive committee, or other similar body chosen by the members at a meeting held for that purpose. No member, officer, agent, or employee shall receive any profit from the distribution or sale of beverages to the members of the club, or their guests, beyond a reasonable salary or wages fixed and voted each year by the governing body.
- F. **Cocktail Room.** Means a facility on or adjacent to the premises of a micro distillery licensed under Minn. Stat. 340A.22, which has been issued a cocktail room license for the on-sale of distilled liquor produced by the distiller for consumption on the premises of or adjacent to one distillery location owned by the distiller.

- G. **Distilled Spirits.** Means ethyl alcohol, hydrated oxide of ethyl, spirits of wine, whiskey, rum, brandy, gin, and other distilled spirits, including all dilutions and mixtures thereof, for non- industrial use.
- H. **Growler.** Means a 64-ounce container of malt liquor brewed and sold to an individual on the site of a licensed Brewery Taproom for consumption off the licensed premises as prescribed for in MS 340A.301.
- I. **Exclusive Liquor Store.** An “Exclusive Liquor Store” is an establishment used exclusively for the sale of:
1. alcoholic beverages;
 2. tobacco products;
 3. ice;
 4. beverages, either liquid or powder, specifically designated for mixing with intoxicating liquor;
 5. soft drinks;
 6. liqueur-filled candies;
 7. food products that contain more than one-half of one percent alcohol by volume;
 8. cork extraction devices;
 9. books and videos on the use of alcoholic beverages;
 10. magazines and other publications published primarily for information and education on alcoholic beverages;
 11. multiple-use bags designed to carry purchased items;
 12. devices designed to ensure safe storage and monitoring of alcohol in the home, to prevent access by underage drinkers; and
 13. home brewing equipment.
 14. clothing marked with the specific name, brand, or identifying logo of the exclusive liquor store, and bearing no other name, brand, or identifying logo.
- J. **Licensed Premises.** Means the premises described in the approved license application, subject to the provisions of Section 340A.410, Subd. 7. In the case of a restaurant, club, or exclusive liquor stores licensed for on-sales of alcoholic beverages and located on a golf course, “licensed premises” means the entire golf course except for areas where motor vehicles are regularly parked or operated.
- K. **Liquor.** Means 3.2 Malt Liquor, Intoxicating Liquor, Strong Beer/Malt Liquor, and Wine.
- L. **Intoxicating Liquor.** Means ethyl alcohol and includes distilled, fermented, spirituous, vinous and malt beverages containing in excess of 3.2 percent of alcohol by weight.
- M. **3.2 Malt Liquor.** (Often referred to as 3.2 beer) Means any potable malt beverage with an alcoholic content of more than one-half percent ($\frac{1}{2}\%$) by volume and not more than three point two percent (3.2%) by weight.
- N. **Micro-Distillery.** Means a distillery operated within the State producing premium, distilled spirits in total quantity not to exceed 40,000 proof gallons in a calendar year and licensed under Minn. Stat. 340A.22.
- O. **Off-Sale.** Means the sale of liquor in the original package in retail stores for consumption off or away from the premises where sold.
- P. **On-Sale.** Means the sale of liquor by the glass, or by the drink for consumption on the premises only.

2016 Minnesota Statutes

Authenticate**340A.101 DEFINITIONS.**

Subdivision 1. **Terms.** For purposes of this chapter the following terms have the meanings given them.

Subd. 2. **Alcoholic beverage.** "Alcoholic beverage" is any beverage containing more than one-half of one percent alcohol by volume.

Subd. 3. **Affiliate or subsidiary company.** "Affiliate or subsidiary company" is a company in which a manufacturer or its stockholders own a majority of the stock.

Subd. 3a. **Brew pub.** "Brew pub" is a brewer who also holds one or more retail on-sale licenses and who manufactures fewer than 3,500 barrels of malt liquor in a year, at any one licensed premises, the entire production of which is solely for consumption on tap on any licensed premises owned by the brewer, or for off-sale from those licensed premises as permitted in section 340A.24, subdivision 2.

Subd. 4. **Brewer.** "Brewer" is a person who manufactures malt liquor for sale.

Subd. 4a. **Bulk distilled spirits.** "Bulk distilled spirits" means distilled spirits in a container having a capacity in excess of one gallon.

Subd. 4b. **Bulk wine.** "Bulk wine" means wine in a container having a capacity of five or more gallons.

Subd. 5. **City.** "City" is a home rule charter or statutory city unless otherwise specified.

Subd. 6. **Commissioner.** "Commissioner" is the commissioner of public safety except as otherwise provided.

Subd. 7. **Club.** "Club" is an incorporated organization organized under the laws of the state for civic, fraternal, social, or business purposes, for intellectual improvement, or for the promotion of sports, or a congressionally chartered veterans' organization, which:

(1) has more than 30 members;

(2) has owned or rented a building or space in a building for more than one year that is suitable and adequate for the accommodation of its members;

(3) is directed by a board of directors, executive committee, or other similar body chosen by the members at a meeting held for that purpose. No member, officer, agent, or employee shall receive any profit from the distribution or sale of beverages to the members of the club, or their guests, beyond a reasonable salary or wages fixed and voted each year by the governing body.

Subd. 8. **Department.** "Department" is the Department of Public Safety except as otherwise provided.

Subd. 9. **Distilled spirits.** "Distilled spirits" is ethyl alcohol, hydrated oxide of ethyl, spirits of wine, whiskey, rum, brandy, gin, and other distilled spirits, including all dilutions and mixtures thereof, for nonindustrial use.

Subd. 10. **Exclusive liquor store.** "Exclusive liquor store" is an establishment used exclusively for the sale of those items authorized in section 340A.412, subdivision 14.

Subd. 10a. **Fortified wine.** "Fortified wine" is wine to which brandy, or neutral grape spirits, has been added during or after fermentation resulting in a beverage containing not less than one-half of one percent nor more than 24 percent alcohol by volume for nonindustrial use.

Subd. 11. **Farm winery.** "Farm winery" is a winery operated by the owner of a Minnesota farm and producing table, sparkling, or fortified wines from grapes, grape juice, other fruit bases, or honey with a majority of the ingredients grown or produced in Minnesota.

Subd. 12. **General food store.** "General food store" is a business primarily engaged in selling food and grocery supplies to the public for off-premise consumption.

Subd. 12a. **Home brewing equipment.** "Home brewing equipment" means portable equipment designed for use in home manufacturing of malt liquor in quantities of ten gallons or less and supplies and ingredients for home manufacture of malt liquor.

Subd. 13. **Hotel.** "Hotel" is an establishment where food and lodging are regularly furnished to transients and which has:

(1) a dining room serving the general public at tables and having facilities for seating at least 30 guests at one time; and

(2) guest rooms in the following minimum numbers: in first class cities, 50; in second class cities, 25; in all other cities and unincorporated areas, 10.

Subd. 14. **Intoxicating liquor.** "Intoxicating liquor" is ethyl alcohol, distilled, fermented, spirituous, vinous, and malt beverages containing more than 3.2 percent of alcohol by weight.

Subd. 15. **Licensed premises.** "Licensed premises" is the premises described in the approved license application, subject to the provisions of section [340A.410, subdivision 7](#). In the case of a restaurant, club, or exclusive liquor store licensed for on-sales of alcoholic beverages and located on a golf course, "licensed premises" means the entire golf course except for areas where motor vehicles are regularly parked or operated.

Subd. 15a. **Low-alcohol malt liquor.** "Low-alcohol malt liquor" is a fermented malt beverage containing two percent or less of alcohol by weight. Notwithstanding any law or rule to the contrary, if either: (a) the term "low alcohol" appears on the label of the beverage container; or (b) a brewer has provided written certification to the Department of Public Safety establishing an alcoholic content of two percent or less by weight; no further label shall be required on that container.

Subd. 15b. **Liqueur-filled candy.** "Liqueur-filled candy" is any confectionery containing more than one-half of one percent alcohol by volume in liquid form that is intended for or capable of beverage use.

Subd. 16. **Malt liquor.** "Malt liquor" is any beer, ale, or other beverage made from malt by fermentation and containing not less than one-half of one percent alcohol by volume.

Subd. 17. **Manufacturer.** "Manufacturer" is a person who, by a process of manufacture, fermenting, brewing, distilling, refining, rectifying, blending, or by the combination of different materials, prepares or produces intoxicating liquor for sale.

Subd. 17a. **Microdistillery.** "Microdistillery" is a distillery operated within the state producing premium, distilled spirits in total quantity not to exceed 40,000 proof gallons in a calendar year.

Subd. 18. **Municipality.** "Municipality" is a city, county or, for purposes of licensing under section [340A.404, subdivision 7](#), the Metropolitan Airports Commission.

Subd. 19. **3.2 percent malt liquor.** "3.2 percent malt liquor" is malt liquor containing not less than one-half of one percent alcohol by volume nor more than 3.2 percent alcohol by weight.

Subd. 20. **Off-sale.** "Off-sale" is the sale of alcoholic beverages in original packages for consumption off the licensed premises only.

Subd. 21. **On-sale.** "On-sale" is the sale of alcoholic beverages for consumption on the licensed premises only.

Subd. 22. **Package.** "Package" is a sealed or corked container of alcoholic beverages.

Subd. 23. **Person.** "Person" has the meaning given it in section [645.44, subdivision 7](#).

Subd. 24. **Population.** "Population" is determined by the most recent federal decennial census or a special census taken under law.

Subd. 24a. MS 2010 [Renumbered subd 24b]

Subd. 24a. **Proof gallon.** A "proof gallon" is one liquid gallon of distilled spirits that is 50 percent alcohol at 60 degrees Fahrenheit.

Subd. 24b. **Public facility.** "Public facility" is a park, community center, or other accommodation or facility owned or managed by or on behalf of a subdivision of the state, including any county, city, town, township, or independent district of the state.

Subd. 25. **Restaurant.** "Restaurant" is an establishment, other than a hotel, under the control of a single proprietor or manager, where meals are regularly prepared on the premises and served at tables to the general public, and having a minimum seating capacity for guests as prescribed by the appropriate license issuing authority.

Subd. 26. **Retail.** "Retail" is sale for consumption.

Subd. 27. **Table or sparkling wine.** "Table or sparkling wine" is a beverage made without rectification or fortification and containing not more than 25 percent of alcohol by volume and made by the fermentation of grapes, grape juice, other fruits, or honey.

Subd. 27a. **Theater.** "Theater" means a building containing an auditorium in which live dramatic, musical, dance, or literary performances are regularly presented to holders of tickets for those performances.

Subd. 28. **Wholesaler.** "Wholesaler" is a person who sells alcoholic beverages to persons to whom sale is permitted under section 340A.310, from a stock maintained in a warehouse in the state.

Subd. 29. **Wine.** "Wine" is the product made from the normal alcoholic fermentation of grapes, including still wine, sparkling and carbonated wine, wine made from condensed grape must, wine made from other agricultural products than sound, ripe grapes, imitation wine, compounds sold as wine, vermouth, cider, perry and sake, in each instance containing not less than one-half of one percent nor more than 24 percent alcohol by volume for nonindustrial use. Wine does not include distilled spirits as defined in subdivision 9.

Subd. 30. MS 2008 [Renumbered subd 10a]

History: 1985 c 117 s 3; 1985 c 305 art 3 s 1; 1Sp1985 c 16 art 2 s 3 subd 1; 1987 c 152 art 1 s 1; 1987 c 381 s 2; 1988 c 443 s 1; 1990 c 554 s 2,3; 1991 c 249 s 31; 1992 c 486 s 5,6; 1993 c 350 s 4-6; 1994 c 611 s 6; 1995 c 198 s 1-3; 2000 c 440 s 2; 2003 c 126 s 1; 2006 c 210 s 1,2; 2009 c 120 s 1; 2011 c 55 s 1,2; 2014 c 240 s 3,4; 2015 c 9 art 1 s 1

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2016 Minnesota Statutes

Authenticate**340A.22 MICRODISTILLERIES.**

Subdivision 1. **Activities.** (a) A microdistillery licensed under this chapter may provide on its premises samples of distilled spirits manufactured on its premises, in an amount not to exceed 15 milliliters per variety per person. No more than 45 milliliters may be sampled under this paragraph by any person on any day.

(b) A microdistillery can sell cocktails to the public, pursuant to subdivision 2.

Subd. 2. **Cocktail room license.** (a) A municipality, including a city with a municipal liquor store, may issue the holder of a microdistillery license under this chapter a microdistillery cocktail room license. A microdistillery cocktail room license authorizes on-sale of distilled liquor produced by the distiller for consumption on the premises of or adjacent to one distillery location owned by the distiller. Nothing in this subdivision precludes the holder of a microdistillery cocktail room license from also holding a license to operate a restaurant at the distillery. Section 340A.409 shall apply to a license issued under this subdivision. All provisions of this chapter that apply to a retail liquor license shall apply to a license issued under this subdivision unless the provision is explicitly inconsistent with this subdivision.

(b) A distiller may only have one cocktail room license under this subdivision, and may not have an ownership interest in a distillery licensed under section 340A.301, subdivision 6, clause (a).

(c) The municipality shall impose a licensing fee on a distiller holding a microdistillery cocktail room license under this subdivision, subject to limitations applicable to license fees under section 340A.408, subdivision 2, paragraph (a).

(d) A municipality shall, within ten days of the issuance of a license under this subdivision, inform the commissioner of the licensee's name and address and trade name, and the effective date and expiration date of the license. The municipality shall also inform the commissioner of a license transfer, cancellation, suspension, or revocation during the license period.

(e) No single entity may hold both a cocktail room and taproom license, and a cocktail room and taproom may not be colocated.

Subd. 3. **License; fee.** The commissioner shall establish a fee for licensing microdistilleries that adequately covers the cost of issuing the license and other inspection requirements. The fees shall be deposited in an account in the special revenue fund and are appropriated to the commissioner for the purposes of this subdivision. All other requirements of section 340A.301 apply to a license under this section.

Subd. 4. **Off-sale license.** A microdistillery may be issued a license by the local licensing authority for off-sale of distilled spirits. The license may allow the sale of one 375 milliliter bottle per customer per day of product manufactured on site, subject to the following requirements:

(1) off-sale hours of sale must conform to hours of sale for retail off-sale licensees in the licensing municipality; and

(2) no brand may be sold at the microdistillery unless it is also available for distribution by wholesalers.

History: 2014 c 240 s 5; 2015 c 9 art 1 s 2; art 2 s 1

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340A.24 BREW PUBS.

Subdivision 1. **On-sale license.** A brew pub may be issued an on-sale intoxicating liquor or 3.2 percent malt liquor license by a municipality for a restaurant operated in the place of manufacture.

Subd. 2. **Off-sale license.** Notwithstanding section 340A.405, a brew pub that holds an on-sale license issued pursuant to this section may, with the approval of the commissioner, be issued a license by a municipality for off-sale of malt liquor produced and packaged on the licensed premises. Off-sale of malt liquor shall be limited to the legal hours for off-sale at exclusive liquor stores in the jurisdiction in which the brew pub is located, and the malt liquor sold off-sale must be removed from the premises before the applicable off-sale closing time at exclusive liquor stores, except that malt liquor in growlers only may be sold at off-sale on Sundays. Sunday sales must be approved by the licensing jurisdiction and hours may be established by those jurisdictions. Packaging of malt liquor for off-sale under this subdivision must comply with section 340A.285.

Subd. 3. **Total retail sales.** A brew pub's total retail sales at on- or off-sale under this section may not exceed 3,500 barrels per year, provided that off-sales may not total more than 500 barrels.

Subd. 4. **Interest in other license.** (a) A brew pub may hold or have an interest in other retail on-sale licenses, but may not have an ownership interest in whole or in part, or be an officer, director, agent, or employee of, any other manufacturer, brewer, importer, or wholesaler, or be an affiliate thereof whether the affiliation is corporate or by management, direction, or control.

(b) Notwithstanding this prohibition, a brew pub may be an affiliate or subsidiary company of a brewer licensed in Minnesota or elsewhere if that brewer's only manufacture of malt liquor is:

(1) manufacture licensed under section 340A.301, subdivision 6, clause (d);

(2) manufacture in another state for consumption exclusively in a restaurant located in the place of manufacture; or

(3) manufacture in another state for consumption primarily in a restaurant located in or immediately adjacent to the place of manufacture if the brewer was licensed under section 340A.301, subdivision 6, clause (d), on January 1, 1995.

Subd. 5. **Prohibition.** A brew pub licensed under this chapter may not be licensed as an importer under section 340A.302.

History: 2015 c 9 art 1 s 3, 8; art 2 s 3

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2016 Minnesota Statutes

[Authenticate](#)**340A.26 BREWER TAPROOMS.**

Subdivision 1. Brewer taproom license. (a) A municipality, including a city with a municipal liquor store, may issue the holder of a brewer's license under section [340A.301](#), subdivision 6, clause (c), (i), or (j), a brewer taproom license. A brewer taproom license authorizes on-sale of malt liquor produced by the brewer for consumption on the premises of or adjacent to one brewery location owned by the brewer. Nothing in this subdivision precludes the holder of a brewer taproom license from also holding a license to operate a restaurant at the brewery. Section [340A.409](#) shall apply to a license issued under this subdivision. All provisions of this chapter that apply to a retail liquor license shall apply to a license issued under this subdivision unless the provision is explicitly inconsistent with this subdivision.

(b) A brewer may only have one taproom license under this subdivision, and may not have an ownership interest in a brew pub.

Subd. 2. Prohibition. A municipality may not issue a brewer taproom license to a brewer if the brewer seeking the license, or any person having an economic interest in the brewer seeking the license or exercising control over the brewer seeking the license, is a brewer that brews more than 250,000 barrels of malt liquor annually or a winery that produces more than 250,000 gallons of wine annually.

Subd. 3. Fee. The municipality shall impose a licensing fee on a brewer holding a brewer taproom license under this subdivision, subject to limitations applicable to license fees under section [340A.408](#), subdivision 2, paragraph (a).

Subd. 4. Municipality to inform commissioner. A municipality shall, within ten days of the issuance of a license under this subdivision, inform the commissioner of the licensee's name and address and trade name, and the effective date and expiration date of the license. The municipality shall also inform the commissioner of a license transfer, cancellation, suspension, or revocation during the license period.

Subd. 5. Sunday on-sale. Notwithstanding section [340A.504](#), subdivision 3, a taproom may be open and may conduct on-sale business on Sundays if authorized by the municipality.

History: [2015 c 9 art 1 s 4](#)

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2016 Minnesota Statutes

Authenticate

340A.285 GROWLERS.

(a) Malt liquor authorized for off-sale pursuant to section 340A.24 or 340A.28 shall be packaged in 64-ounce containers commonly known as "growlers" or in 750 milliliter bottles. The containers or bottles shall bear a twist-type closure, cork, stopper, or plug. At the time of sale, a paper or plastic adhesive band, strip, or sleeve shall be applied to the container or bottle and extended over the top of the twist-type closure, cork, stopper, or plug forming a seal that must be broken upon opening the container or bottle. The adhesive band, strip, or sleeve shall bear the name and address of the brewer. The containers or bottles shall be identified as malt liquor, contain the name of the malt liquor, bear the name and address of the brew pub or brewer selling the malt liquor, and shall be considered intoxicating liquor unless the alcoholic content is labeled as otherwise in accordance with the provisions of Minnesota Rules, part 7515.1100.

(b) A brew pub or brewer may, but is not required to, refill any container or bottle with malt liquor for off-sale at the request of the customer. A brew pub or brewer refilling a container or bottle must do so at its licensed premises and the container or bottle must be filled at the tap at the time of sale. A container or bottle refilled under this paragraph must be sealed and labeled in the manner described in paragraph (a).

History: 2015 c 9 art 1 s 6

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Community Development Department

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To: Planning Commission
From: Al Cottingham, City Planner/Zoning Administrator
Date: March 8, 2017

ITEM DESCRIPTION: Crematories

At the last meeting there was some brief discussion regarding crematories and where they are currently allowed within the city and the commissioners thoughts as to looking at the possibility of expanding those areas. The commission was receptive to the idea and asked that additional information be brought to them for further discussion.

Attached for your information is some general information on the cremation process and the history of cremation and of the crematory itself.

As for other communities from what I have found is the City of Duluth has two crematories, one at Park Hill Cemetary in east Duluth approximately 350 feet from a residential neighborhood. The other at 4100 Grand Avenue in west Duluth with residential homes across the street.

Grand Rapids has one in their commercial/downtown area with residential homes as close as 150 feet away. They treat them as an accessory use to the funeral home.

Northfield currently has two crematories one in a residential neighborhood and one in a commercial district. They also treat them as an accessory use to the funeral home.

The Minnesota Department of Health is the regulatory agency that licenses crematories.

This provides you a little information to bigin discussions on this topic at our meeting.

- [Cremation](#)
- [Contact](#)

How Is Cremation Done?
What Does Crematorium Mean?
What Is The Cost Of Human Cremation?
How Is A Body Cremated?
How To Decide Whether To Cremate Or Bury?
What Are The Storage Options For Cremated Ashes?
What Does The Bible Say About Cremation?
What Do Catholics Believe About Cremation?
What Type Of Cremations Are There?
How To Arrange A Cremation?
How To Explain Cremation To A Child?
15 Weird And Wacky Coffins
What Is A Cremation Urn?
How To Choose A Cremation Urn?
11 Odd And Unusual Cremation Urns That You Have Never Seen Before
Cremation Urn Buying Tips - Top 5 Things To Keep In Mind
What Is Cremation Jewelry?
How To Choose Cremation Jewelry?
What Is A Headstone?
How Is A Headstone Made?
12 Strange and Bizarre Gravestones
How Is Pet Cremation Done?
How Does Pet Cremation Work?
How Much Does Cat Cremation Cost?
Pet Cremation FAQ
15 Unusual And Strange Memorial Monuments

How Is A Body Cremated?

Cremation of a dead body is carried out at a temperature ranging between 1400 to 1800 degrees Fahrenheit. The intense heat helps **reduce the body to its basic elements** and dried bone fragments.

The process takes place in a cremation chamber, also known as a retort, of a crematory. The chamber is **preheated** at a set point and then body is placed is quickly transferred there through a mechanized door to avoid heat loss.

Here's a video showing the cremation of human body.



During incineration, the body is exposed to a column of flames produced by a furnace fueled by natural gas, oils, propane, etc.

As the corpse is placed in a casket or container (preferably prepared from a combustible material), the container burns down.

Next, the heat **dries the body**, burns the skin and hair, contracts and chars the muscles, vaporizes the soft tissues, and **calcifies the bones** so that they eventually crumble. The gases released during the process are discharged through an exhaust system.

The bodies are mostly burned one at a time. There is **usually no smell** because the emissions are processed to destroy the smoke and vaporize the gases that would smell.

Some crematories have a secondary afterburner to help burn the body completely. Otherwise, the cremation technician may have to crush the partially cremated remains with the help of a long hoe-like rod.

As a result, the corpse is **reduced to skeletal remains and bone fragments**. It is then collected in a tray or pan (tiny residue may still remain in the chamber and mix with the particles from subsequent cremations) and allowed to cool for sometime.

These remains, however, also contain **non-consumed metal objects** such as screws, nails, hinges, and other parts of the casket or container.

In addition, the mixture may contain dental work, dental gold, surgical screws, prosthesis, implants, etc. These objects are removed with the help of strong magnets and/or forceps after manual inspection. All these metals are later disposed of as per the local laws.

Mechanical devices, **pacemakers**, in particular, are removed beforehand because they may explode due to the intense heat and damage the cremation equipment and staff.

It is suggested to remove jewelry items like rings, wrist washes, and other similar objects, too, as they are likely to break down during the process.

Moreover, the metal pieces are removed before the next process because they may damage the equipment used for pulverization.

Finally, the dried bone fragments are further ground into a finer sand-like consistency. The machine used for this pulverization is called **cremulator**.

On an average, it takes about **one to three hours** to cremate a human body, thereby reducing it to **3-7 pounds of cremains**. The cremation remains are usually pasty white in color.

These remains are transferred in a cremation urn and given to the relative or representative of the deceased. If you do not have an urn, the crematorium may return the ashes in a plastic box or default container.

Factors Affecting Cremation Time

The duration of a cremation process usually depends on certain factors. They are:

- weight or size of the body
- percentage of body fat to lean muscle mass
- the performance of cremation equipments used
- operating temperature of the cremation chamber
- the type of cremation container or casket in which the body is placed

Most Popular:



[Cremation Urn Buying Tips - Top 5 Things To Keep In Mind](#)



[15 Unusual And Strange Memorial Monuments](#)



[12 Strange and Bizarre Gravestones](#)



[15 Weird And Wacky Coffins](#)

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Cremation

From Wikipedia, the free encyclopedia

Cremation is the combustion, vaporization and oxidation of cadavers to basic chemical compounds, such as gases, ashes and mineral fragments retaining the appearance of dry bone.^[1] Cremation may serve as a funeral or post-funeral rite as an alternative to the interment of an intact dead body in a coffin, casket or shroud.

Cremated remains (aka "cremains" or simply, "ashes"),^{[2][3]} which do not constitute a health risk, may be buried or interred in memorial sites or cemeteries, or they may be retained by relatives and dispersed in various ways. Cremation is not an alternative to a funeral, but rather an alternative to burial or other forms of disposal. Some families prefer to have the deceased present at the funeral with cremation to follow; others prefer that the cremation occur prior to the funeral or memorial service.

In many countries, cremation is usually done in a crematorium. Some countries, such as India and Nepal, prefer different methods, such as open-air cremation.



Hindu cremation in Bali



Pashupatinath Temple

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 - 1.3 Modern era
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- 3 Modern cremation process
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 - 3.2 Burning and ashes collection
 - 3.3 Ash weight and composition
- 4 Methods of retaining or disposing of the cremated remains
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 - 9.1 The Tri-State Crematory Incident
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Cremation of a dead body

History

Ancient

Cremation dates from at least 20,000 years ago in the archaeological record, with the Mungo Lady, the remains of a partly cremated body found at Lake Mungo, Australia.

Alternative death rituals emphasizing one method of disposal of a body—inhumation (burial), cremation, or exposure—have gone through periods of preference throughout history.

In the Middle East and Europe, both burial and cremation are evident in the archaeological record in the Neolithic era. Cultural groups had their own preferences and prohibitions. The ancient Egyptians developed an intricate transmigration of soul theology, which prohibited cremation. This was also widely adopted used by Semitic peoples. The Babylonians, according to Herodotus, embalmed their dead. Early Persians practiced cremation, but this became prohibited during the Zoroastrian Period. Phoenicians practiced both cremation and burial. From the Cycladic civilisation in 3000 BCE until the Sub-Mycenaean era in 1200–1100 BCE, Greeks practiced inhumation. Cremation appeared around the 12th century BCE, constituting a new practice of burial, probably influenced by Anatolia. Until the Christian era, when inhumation again became the only burial practice, both combustion and inhumation had been practiced, depending on the era and location.^[4] Romans practiced both, with cremation generally associated with military honors.



Bronze container of ancient cremated human remains, complete with votive offering

In Europe, there are traces of cremation dating to the Early Bronze Age (c. 2000 BCE) in the Pannonian Plain and along the middle Danube. The custom became dominant throughout Bronze Age Europe with the Urnfield culture (from c. 1300 BCE). In the Iron Age, inhumation again becomes more common, but cremation persisted in the Villanovan culture and elsewhere. Homer's account of Patroclus' burial describes

cremation with subsequent burial in a tumulus, similar to Urnfield burials, and qualifying as the earliest description of cremation rites. This may be an anachronism, as during Mycenaean times burial was generally preferred, and Homer may have been reflecting the more common use of cremation at the time the Iliad was written, centuries later.

Criticism of burial rites is a common form of aspersion by competing religions and cultures, including the association of cremation with fire sacrifice or human sacrifice.

Hinduism and Jainism are notable for not only allowing but prescribing cremation. Cremation in India is first attested in the Cemetery H culture (from c. 1900 BCE), considered the formative stage of Vedic civilization. The Rigveda contains a reference to the emerging practice, in RV 10.15.14, where the forefathers "both cremated (*agnidagdhá-*) and uncremated (*ánagnidagdha-*)" are invoked.

Cremation remained common, but not universal, in both ancient Greece and ancient Rome. According to Cicero, in Rome, inhumation was considered the more archaic rite, while the most honoured citizens were most typically cremated—especially upper classes and members of imperial families.

The rise of Christianity saw an end to cremation, being influenced by its roots in Judaism, the belief in the resurrection of the body, and following the example of Christ's burial. Anthropologists have been able to track the advance of Christianity throughout Europe with the appearance of cemeteries. By the 5th century, with the spread of Christianity, the practice of burning bodies gradually disappeared from Europe.

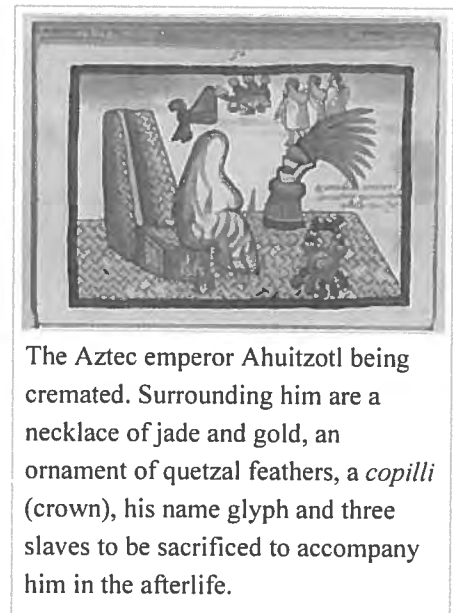
In early Roman Britain, cremation was usual but diminished by the 4th century. It then reappeared in the 5th and 6th centuries during the migration era, when sacrificed animals were sometimes included with the human bodies on the pyre, and the deceased were dressed in costume and with ornaments for the burning. That custom was also very widespread among the Germanic peoples of the northern continental lands from which the Anglo-Saxon migrants are supposed to have been derived, during the same period. These ashes were usually thereafter deposited in a vessel of clay or bronze in an "urn cemetery". The custom again died out with the Christian conversion of the Anglo-Saxons or Early English during the 7th century, when Christian burial became general.^[5]

Middle Ages

Throughout parts of Europe, cremation was forbidden by law, and even punishable by death if combined with Heathen rites.^[6]

Cremation was sometimes used by Catholic authorities as part of punishment for Protestant heretics, and this did not only include burning at the stake. For example, the body of John Wycliff was exhumed years after his death and burned to ashes, with the ashes thrown in a river,^[7] explicitly as a posthumous punishment for his denial of the Roman Catholic doctrine of transubstantiation.^[8]

Modern era

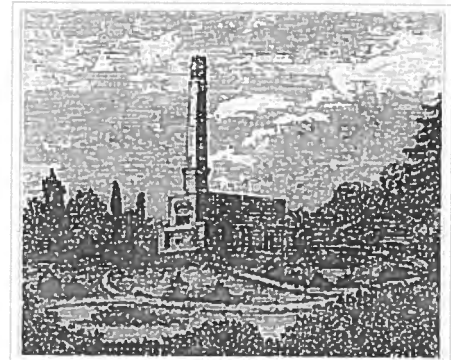


The Aztec emperor Ahuitzotl being cremated. Surrounding him are a necklace of jade and gold, an ornament of quetzal feathers, a *copilli* (crown), his name glyph and three slaves to be sacrificed to accompany him in the afterlife.

The first to advocate for the use of cremation was the physician Sir Thomas Browne in 1658. Honoretta Brooks Pratt became the first recorded cremated European individual in modern times when she died on 26 September 1769 and was illegally cremated at the burial ground on Hanover Square in London.^[9]

The organized movement to reinstate cremation as a viable method for body disposal began in the 1870s. In 1869 the idea was presented to the Medical International Congress of Florence by Professors Coletti and Castiglioni "in the name of public health and civilization". In 1873, Professor Paolo Gorini of Lodi and Professor Ludovico Brunetti of Padua published reports of practical work they had conducted.^[10] A model of Brunetti's cremating apparatus, together with the resulting ashes, was exhibited at the Vienna Exposition in 1873 and attracted great attention, including that of Sir Henry Thompson, 1st Baronet, a surgeon and Physician to the Queen Victoria, who returned home to become the first and chief promoter of cremation in England.^[11]

Sir Henry Thompson's main reason for supporting cremation was that "it was becoming a necessary sanitary precaution against the propagation of disease among a population daily growing larger in relation to the area it occupied". In addition, he believed, cremation would prevent premature burial, reduce the expense of funerals, spare mourners the necessity of standing exposed to the weather during interment, and urns would be safe from vandalism.^[11] On 13 January 1874, some advocates of cremation, including Anthony Trollope, John Everett Millais, George du Maurier, Thomas Spencer Wells, John Tenniel and Shirley Brooks,^[12] held a meeting at Thompson's house in London and formally founded the *Cremation Society of Great Britain* "...expressly for the purpose of obtaining and disseminating information on the subject and for adopting the best method of performing the process, as soon as this could be determined, provided that the act was not contrary to Law."^[11]



The Woking Crematorium, built in 1878 as the first facility in England after a long campaign led by the Cremation Society of Great Britain.



William Price helped to legalize cremation and was himself cremated after his death in 1893.

The first duty of the Cremation Society was to ascertain whether cremation could be legally performed in the country, and then to construct a first crematorium.^[11] In 1878, Sir Henry Thompson bought a piece of land in Woking as a site for the crematorium.^[13] Professor Gorini was invited to visit Woking and supervise the erection of his cremation apparatus there. They first tested it on 17 March 1879 by cremating the body of a horse. However, the inhabitants of Woking showed strong antipathy to the crematorium, and appealed to the Home Secretary, Sir Richard Cross, to prohibit the use of the building.

Legalization of cremation came about through the eccentric activities of Welsh Neo-Druidic priest, William Price. After his first child died in 1884, and believing that it was wrong to bury a

corpse, thereby polluting the earth, Price decided to cremate his son's body.^[14] He was arrested by the police for the illegal disposal of a corpse. Price successfully argued in court that while the law did not state that cremation was legal, it also did not state that it was illegal. The case set a precedent that, together with the

activities of the newly founded Cremation Society of Great Britain, led to the Cremation Act 1902.^[15] The Act imposed procedural requirements before a cremation could occur and restricted the practice to authorised places.^[16]

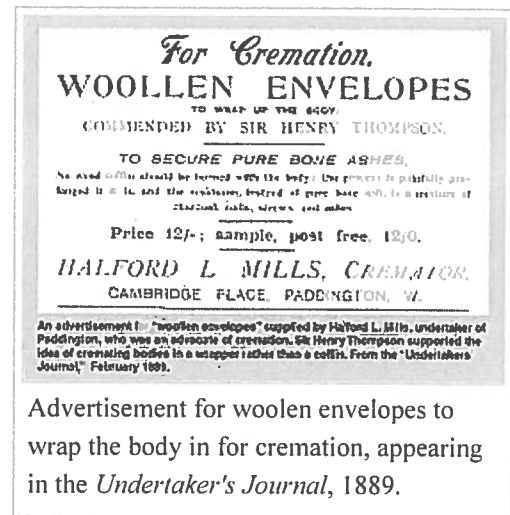
In 1885, the first official cremation in the UK took place in Woking. The deceased was Mrs Jeannette C. Pickersgill, a well-known figure in literary and scientific circles.^[17] By the end of the year, the Cremation Society of Great Britain had overseen two more cremations, a total of 3 out of 597,357 deaths in the UK that year.^[13] In 1886 ten bodies were cremated at Woking Crematorium. During 1888, in which 28 cremations took place, the Cremation Society planned to provide a chapel, waiting rooms and other amenities there. In 1892 a crematorium opened in Manchester, followed by one in Glasgow in 1895, Liverpool in 1896 and Birmingham Crematorium in 1903.^[18]

Crematoria in Europe were built in 1878 in the town of Gotha in Germany and later in Heidelberg in 1891. The first modern crematory in the U.S. was built in 1876 by Francis Julius LeMoyne after hearing about its use in Europe. During that time it was thought that people were getting sick by attending funerals of those recently deceased and that decomposing bodies were leaking into the water systems.^{[19][20]} LeMoyne built the crematory to cremate bodies in a controlled environment primarily for sanitary reasons. Cremation was used to destroy any organic matter that could cause illness and give families a better way to preserve ashes. Before LeMoyne's crematory closed in 1901, it had performed 42 cremations.^[21]

Some of the various Protestant churches came to accept cremation, with the rationale being, "God can resurrect a bowl of ashes just as conveniently as he can resurrect a bowl of dust." The 1908 Catholic Encyclopedia was critical about these efforts, referring to them as a "sinister movement" and associating them with Freemasonry, although it said that "there is nothing directly opposed to any dogma of the Church in the practice of cremation."^[22] In 1963, [at Second Vatican Council] Pope Paul VI lifted the ban on cremation,^[23] and in 1966 allowed Catholic priests to officiate at cremation ceremonies.

In the U.S. only about one crematory per year was built in the late 19th century. As embalming became more widely accepted and used, crematories lost their sanitary edge. Not to be left behind, crematories had an idea of making cremation beautiful. They started building crematories with stained-glass windows and marble floors with frescoed walls. By 2008, the cremation rate was 36.2% and was growing about 1 percentage point a year, according to CANA. CANA is the largest organization representing crematories and funeral homes in the U.S. and Canada.^[21]

Australia also started to establish modern cremation movements and societies. Australians had their first purpose-built modern crematorium and chapel in the West Terrace Cemetery in the South Australian capital of Adelaide in 1901. This small building, resembling the buildings at Woking, remained largely unchanged from its 19th-century style and was in full operation until the late 1950s. The oldest operating crematorium in Australia is at Rookwood Cemetery, in Sydney. It opened in 1925.



Advertisement for woollen envelopes to wrap the body in for cremation, appearing in the *Undertaker's Journal*, 1889.

In the Netherlands, the foundation of the Association for Optional Cremation^[24] in 1874 ushered in a long debate about the merits and demerits of cremation. Laws against cremation were challenged and invalidated in 1915 (two years after the construction of the first crematorium in the Netherlands), though cremation did not become legally recognised until 1955.^[25]

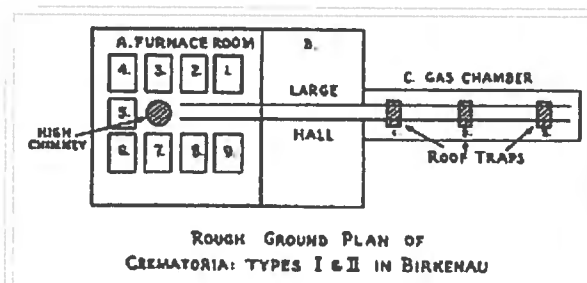
World War II

During World War II (1939–45) Nazi Germany used specially built furnaces in at least six extermination camps throughout occupied Poland including at Auschwitz-Birkenau, Chełmno, Belzec, Majdanek, Sobibor and Treblinka, where the bodies of those murdered by gassing were disposed of using incineration. The efficiency of industrialised killing of *Operation Reinhard* during the most deadly phase of the Holocaust produced too many corpses, therefore the crematoria manufactured to SS specifications were put into use in all of them to handle the disposals around the clock, day and night.^{[26][27]} The Vrba–Wetzler report offers the following description.



Crematorium at Dachau concentration camp

At present there are four crematoria in operation at BIRKENAU, two large ones, I and II, and two smaller ones, III and IV. Those of type I and II consist of 3 parts, i.e.,: (A) the furnace room; (B) the large halls; and (C) the gas chamber. A huge chimney rises from the furnace room around which are grouped nine furnaces, each having four openings. Each opening can take three normal corpses at once and after an hour and a half the bodies are completely burned. This corresponds to a daily capacity of about 2,000 bodies... Crematoria III and IV work on nearly the same principle, but their capacity is only half as large. Thus the total capacity of the four cremating and gassing plants at BIRKENAU amounts to about 6,000 daily.^[28]



A sketch from the Vrba–Wetzler report, showing the rough layout of the crematoria used at Auschwitz, one of the several Nazi German extermination camps in occupied Poland

The Holocaust furnaces were supplied by a number of manufacturers, with the best known and most common being Topf and Sons as well as Kori Company of Berlin,^[29] whose ovens were elongated to accommodate two bodies, slid inside from the back side. The ashes were taken out from the front side.^[30] The furnaces were also unique, in that they were of a "stand alone" type. Meaning that there was no visible duct work for the exhaust gases. These furnaces, based around a design commonly used for hospital incinerators, instead vented the gasses down through a series of ducts embedded in the floor, with the help of a draft fan located at the far

end of the structure. Once outside, the gasses then rose through a free standing chimney, most notable for the fact that it was not directly attached to the structure of the building itself, nor had a visible duct leading into it.

Modern cremation process

The cremation occurs in a crematory that is housed within a *crematorium* and comprises one or more furnaces. A cremator is an industrial furnace that is able to generate temperatures of 870–980 °C (1,600–1,800 °F) to ensure disintegration of the corpse. A crematorium may be part of a chapel or a funeral home or may be an independent facility or a service offered by a cemetery.

Modern cremator fuels include oil,^[31] natural gas, propane, and, in some areas like Hong Kong, coal gas.^[32] However, coal and coke were used until the early 1960s.

Modern cremators have adjustable-control systems that monitor the furnace during cremation. These systems automatically monitor the interior to tell when the cremation process is complete, after which the furnace automatically shuts down. The time required for cremation varies from body to body, and, in modern furnaces, the process may be as fast as one hour per 50 kg (100 lb) of body weight.

A cremator is not designed to cremate more than one human body at a time; cremation of multiple bodies is illegal in the United States and many other countries. Exceptions may be made in special cases, such as with still-born twins or with a still-born baby and a mother who died during childbirth. In such cases, the bodies must be cremated in the same container.

The chamber where the body is placed is called a *retort* and is lined with heat-resistant refractory bricks. Refractory bricks are designed in several layers. The outermost layer is usually simply an insulation material, *e.g.*, mineral wool. Inside is typically a layer of insulation brick, mostly calcium silicate in nature. Heavy duty cremators are usually designed with two layers of fire bricks inside the insulation layer. The layer of fire bricks in contact with the combustion process protects the outer layer and must be replaced from time to time.^[33] The coffin or container is inserted (charged) into the retort as quickly as possible to avoid heat loss through the top door. The container may be mounted on a charger (motorised trolley) that can quickly insert it, or on a fixed or movable hopper that allows the container to slide into the cremator.

Modern cremators are computer-controlled to ensure legal and safe use. For example, the retort door cannot be opened until the cremator has reached its operating temperature, and United States federal regulations^[34] require that newly constructed cremators feature dual electrical and mechanical heat-shutoff switches and door releases that are accessible from inside the retort. Refractory bricks are typically replaced every five years, because thermal fatigue gradually introduces fissures that reduce the insulating strength. For heavy duty cremators having an inner sacrificial layer of refractory material, often cracks, slagging, bulging and dislocation can be seen on this layer shortly after the cremator is put into use. Such cracks and fracture need not be disastrous, as this lining is sacrificial in nature — it may just result in the development of a crack pattern in the lining. Those crack surfaces may be held together and closed by the lining compressive



The Assumption Catholic Cemetery and Crematory in Mississauga, Canada, with chimney visible

stresses that develop from thermal expansion when the cremator is heated to operating temperatures.^[33] However, the inner sacrificial lining needs to be replaced on a regular basis to offer proper protection to the outer layers.

Some crematoria allow relatives to view the charging. This is sometimes done for religious reasons, such as in traditional Hindu and Jain funerals.^[35]

The size of most cremators is standardized. Typically, larger cities have access to an oversized cremator that can handle corpse in the 200 kilograms (440 lb)+ range. Most large crematoria have small cremators installed for the cremation of fetal and infant remains.

In some countries including the United States, there is increasing use of the alkaline hydrolysis process, trademarked as *Resomation*, which involves the use of lye heated with the body at high pressure, allowing the body to be broken down into its chemical compounds. The process is described by its inventors as more ecologically favorable than other forms of cremation.^{[36][37]}

Body container

In the United States federal law does not dictate any container requirements for cremation. Certain states however may require an opaque or non-transparent container of all cremations. This can be a simple corrugated-cardboard box or a wooden casket (coffin). Most casket manufacturers provide lines of caskets that are specially built for cremation. Another option is a cardboard box that fits inside a wooden shell, which is designed to look like a traditional casket. After the funeral service, the box is removed from the shell before cremation, permitting the shell to be re-used. Funeral homes may also offer rental caskets, which are traditional caskets used only during the services, after which the bodies are transferred to other containers for cremation. Rental caskets are sometimes designed with removable beds and liners, which are replaced after each use.

In the United Kingdom, the body is not removed from the coffin and is not placed into a container as described above. The body is cremated with the coffin, which is why all British coffins that are to be used for cremation must be combustible. The Code of Cremation Practice forbids the opening of the coffin once it has arrived at the crematorium, and rules stipulate that it must be cremated within 72 hours of the funeral service.^[38] Therefore, in the United Kingdom, bodies are cremated in the same coffin that they are placed in at the undertaker's, although the regulations allow the use of an approved "cover" during the funeral service.^[38] It is recommended that jewellery be removed before the coffin is sealed, for this reason. When cremation is finished, the remains are passed through a magnetic field to remove any metal, which will be interred elsewhere in the crematorium grounds or, increasingly, recycled.^[39] The ashes are then given to relatives or loved ones or scattered in the crematorium grounds where facilities exist.^[40]



A relic found amid the ashes of Chan Kusalo (the Buddhist Patriarch of Northern Thailand) is placed inside a chedi shaped vial and displayed inside Wat Chedi Luang in Chiang Mai

In Germany, the process is mostly similar to that of the United Kingdom. The body is cremated in the coffin. A piece of fire clay with a number on it is used for identifying the remains of the dead body after burning.^[41] The remains are then placed in a container called an *ash capsule*, which generally is put into a cinerary urn.

In Australia, the deceased is cremated in a coffin supplied by the undertaker. Reusable or cardboard coffins are becoming popular, with several manufacturers now supplying them.^[42] For low cost, a plain, particle-board coffin (known in the trade as a "chippie") can be used. Handles (if fitted) are plastic and approved for use in a cremator. Coffins vary from natural cardboard and unfinished particle board (covered with a velvet pall if there is a service) to solid timber; most are veneered particle board.

Cremations can be "delivery only", with no preceding chapel service at the crematorium (although a church service may have been held) or preceded by a service in one of the crematorium chapels. Delivery-only allows crematoria to schedule cremations to make best use of the cremators, perhaps by holding the body overnight in a refrigerator, allowing a lower fee to be charged. Delivery-only is sometimes called *west chapel service* in industry jargon.

Burning and ashes collection



(Germany) A piece of fire clay used for identifying the ash after burning the dead body



(Germany) A cinerary urn. The laces are used to lower the urn into the ground



(Germany) An open cinerary urn, showing the ash capsule containing the remains of the dead



(Germany) The ash capsule



(Germany) An open ash capsule showing the remains of the dead



(Germany) Ash capsule and cinerary urn after 15 years

The box containing the body is placed in the retort and incinerated at a temperature of 760 to 1150 °C (1400 to 2100 °F). During the cremation process, the greater portion of the body (especially the organs and other soft tissues) is vaporized and oxidized by the intense heat; gases released are discharged through the exhaust system. The process usually takes 90 minutes to two hours, with larger bodies taking longer time.

Jewellery, such as necklaces, wrist-watches and rings, are ordinarily removed before cremation, and returned to the family. Several implanted devices are required to be removed. A pacemaker could explode, damage the cremator, and potentially injure nearby staff; spinal cord stimulators have similar power sources, and implanted drug reservoirs may produce smaller explosions. A specific variety of bone nail used in the femur and humerus is a hollow shell inflated with saline under high pressure to grip the interior of the bone, and constitutes a bomb in the cremator. In the United Kingdom, and possibly other countries, the undertaker is required to remove such devices prior to delivering the body to the crematorium, and sign a declaration stating that no hazardous device remains in place.^[43]

Contrary to popular belief, the cremated remains are not ashes in the usual sense. After the incineration is completed, the dry bone fragments are swept out of the retort and pulverised by a machine called a *Cremulator* — essentially a high-capacity, high-speed blender — to process them into "ashes" or "cremated remains",^{[43][44]} although pulverisation may also be performed by hand. This leaves the bone with a fine sand like texture and color, able to be scattered without need for mixing with any foreign matter,^[45] though the size of the grain varies depending on the Cremulator used. Their weight is approximately 4 pounds (1.8 kg) for adult human females and 6 pounds (2.7 kg) for adult human males. There are various types of Cremulators, including rotating devices, grinders, and older models using heavy metal balls.^[46]

The grinding process typically takes about 20 minutes.

In a Japanese funeral and in Taiwan, the bones are not pulverised, unless requested beforehand. When not pulverised, the bones are collected by the family and stored as one might do with ashes.

The appearance of cremated remains after grinding is one of the reasons they are called *ashes*, although a non-technical term sometimes used is "cremains",^{[2][3]} a portmanteau of "cremated" and "remains". (The Cremation Association of North America prefers that the word "cremains" not be used for referring to "human cremated remains". The reason given is that "cremains" is thought to have less connection with the deceased, whereas a loved one's "cremated remains" has a more identifiable human connection.^[47])



Bone-picking ceremony at a Japanese funeral

After final grinding, the ashes are placed in a container, which can be anything from a simple cardboard box to a decorative urn. The default container used by most crematoriums, when nothing more expensive has been selected, is usually a hinged, snap-locking plastic box.

An unavoidable consequence of cremation is that a tiny residue of bodily remains is left in the chamber after cremation and mixes with subsequent cremations.

Ash weight and composition

Cremated remains are mostly dry calcium phosphates with some minor minerals, such as salts of sodium and potassium. Sulfur and most carbon are driven off as oxidized gases during the process, although a relatively small amount of carbon may remain as carbonate.

The ash remaining represents very roughly 3.5% of the body's original mass (2.5% in children). Because the weight of dry bone fragments is so closely connected to skeletal mass, their weight varies greatly from person to person. Because many changes in body composition (such as fat and muscle loss or gain) do not affect the weight of cremated remains, the weight of the remains can be more closely predicted from the person's height and sex (which predicts skeletal weight), than it can be predicted from the person's simple weight.



Ashes of adults can be said to weigh from 4 pounds (1.8 kg) to 6 pounds (2.7 kg), but the first figure is roughly the figure for women, and the second, for men. The mean weight of adult cremated remains in a Florida, U.S. sample was 5.3 lb (approx. 2.4 kg) for adults (range 2 to 8 lb or 0.91 to 3.63 kg). This was found to be distributed bimodally according to sex, with the mean being 6 pounds (2.7 kg) for men (range 4 to 8 lb or 1.8 to 3.6 kg) and 4 pounds (1.8 kg) for women (range 2 to 6 lb or 0.91 to 2.72 kg). In this sample, generally all adult cremated remains over 6 pounds (2.7 kg) were from males, and those under 4 pounds (1.8 kg) were from females.^[48]

Not all that remains is bone. There may be melted metal lumps from missed jewellery; casket furniture; dental fillings; and surgical implants, such as hip replacements. Breast implants do not have to be removed before cremation.^[49] Large items such as titanium hip replacements (which tarnish but do not melt) or casket hinges are usually removed before processing, as they may damage the processor. (If they are missed at first, they must ultimately be removed before processing is complete, as items such as titanium joint replacements are far too durable to be ground). Implants may be returned to the family, but are more commonly sold as ferrous/non-ferrous scrap metal. After the remains are processed, smaller bits of metal such as tooth fillings, and rings (commonly known as *gleanings*) are sieved out and may be later interred in common, consecrated ground in a remote area of the cemetery. They may also be sold as precious metal scrap.

Methods of retaining or disposing of the cremated remains

Cremated remains are returned to the next of kin in different manners according to custom and country. In the United States, the cremated remains are almost always contained in a thick watertight polyethylene plastic bag contained within a hard snap-top rectangular plastic container, which is labeled with a printed paper label. The basic sealed plastic container bag may be contained within a further cardboard box or velvet sack, or they may be contained within an urn if the family had already purchased one. An official certificate of cremation prepared under the authority of the crematorium accompanies the remains, and if required by law, the permit for disposition of human remains, which must remain with the cremated remains.

Cremated remains can be kept in an urn, stored in a special memorial building (columbarium), buried in the ground at many locations or sprinkled on a special field, mountain, or in the sea. In addition, there are several services in which the cremated remains will be scattered in a variety of ways and locations. Some examples are via a helium balloon, through fireworks, shot from shotgun shells, by boat^[50] or scattered from an aeroplane. One service sends a lipstick-tube sized sample of the cremated remains into low earth orbit,

where they remain for years (but not permanently) before reentering the atmosphere. Some companies offer a service to turn part of the cremated remains into synthetic diamonds that can then be made into jewelry.^[51] Cremated remains may also be incorporated, with urn and cement, into part of an artificial reef, or they can also be mixed into paint and made into a portrait of the deceased. Some individuals use a very small amount of the remains in tattoo ink, for remembrance portraits. Cremated remains can be scattered in national parks in the United States with a special permit. They can also be scattered on private property with the permission of the owner. A portion of the cremated remains may be retained in a specially designed locket known as cremation jewelry, or even blown into special glass keepsakes^[52] and glass orbs.^[53] The cremated remains may also be entombed. Most cemeteries will grant permission for burial of cremated remains in occupied cemetery plots that have already been purchased or are in use by the families disposing of the cremated remains without any additional charge or oversight. The possibilities are as limitless as the individuals who are being remembered.

The final disposition depends on the personal preferences of the deceased as well as their cultural and religious beliefs. Some religions will permit the cremated remains to be sprinkled or retained at home. Some religions, such as Roman Catholicism, prefer to either bury or entomb the remains. Hinduism obliges the closest male relative (son, grandson, etc.) of the deceased to immerse the cremated remains in the holy river Ganges, preferably at the holy city of Triveni Sangam, Allahabad, or Varanasi or Haridwar, India. The Sikhs immerse the remains in Sutlej, usually at Sri Harkiratpur. In southern India, the ashes are immersed in the river Kaveri at Paschima vahini in Srirangapattana at a stretch where the river flows from east to west, depicting the life of a human being from sunrise to sunset. In Japan and Taiwan, the remaining bone fragments are given to the family and are used in a burial ritual before final interment.



A U.S. Navy sailor scatters cremated remains at sea. This is normal in American packaging. Visible is the clear plastic inner bag containing the remains, and next to it the labeled black plastic box that contained the inner bag

Reasons for choosing cremation



Cremation allows for very economical use of cemetery space. Mini-gravestones in Helsinki.

Aside from religious reasons (discussed below), some people find they prefer cremation over traditional burial for personal reasons. The thought of a long and slow decomposition process is unappealing to some;^[54] many people find that they prefer cremation because it disposes of the body instantly.^[55]

Other people view cremation as a way of simplifying their funeral process. These people view a ground burial as an unneeded complication of their funeral process, and thus choose cremation to make their services as simple as possible.

In agriculturally dependent India, it was believed quite early that interring bodies to rot in the soil might render an area infertile. This is why cremation was preferred initially, even before it was

introduced into the Rigveda.

The cost factor tends to make cremation attractive. Generally speaking, cremation is cheaper than a traditional burial service,^[56] especially if direct cremation is chosen, in which the body is cremated as soon as legally possible without any sort of services. However, for some even cremation is still relatively expensive, especially as a lot of fuel is required to perform it. Methods to reduce fuel consumption/fuel cost include the use of different fuels (i.e. natural gas or propane, compared to wood) and by using an incinerator (Retort) (closed cabin) rather than an open fire.^[57]

For surviving kin, cremation is preferred because of simple portability. Survivors relocating to another city or country have the option of transporting their loved ones with the ultimate goal of being interred or scattered together.

Cremated remains can be scattered or buried. Cremation plots or columbarium niches are usually cheaper than a traditional burial plot or mausoleum crypt, and require less space. Some religions, such as Roman Catholicism, require the burial or entombment of cremated remains, but burial of cremated remains may often be accomplished in the burial plot of another person, such as a family member, without any additional cost. This option is charged for in England in an Anglican church where the fee is set by the Table of Parochial Fees (£36 to incumbent and £78 to church council) a total of £114 in 2010 with a marker charged as extra. It is also very common to scatter the remains in a place the deceased liked—such as the sea, a river, a beach, a park, or mountains, following their last will. This is generally forbidden in public places but easy to do. Some persons choose to have a small part of their ashes (usually less than 1 part in 1000, because of cost constraints) scattered in space (known as space burial and offered by companies such as Elysium Space, Celestis and Ascending Memories). Cremated remains can now also be converted to diamonds.

Environmental impact

Cremation might be preferable for environmental reasons. Burial is a known source of certain environmental contaminants, with the coffin itself being the major contaminant, however in some countries e.g. the UK, legislations now requires that cremators be fitted with abatement equipment (filters) that remove serious pollutants such as mercury.

Each cremation uses about 28 gallons of fuel and releases about 540 pounds of carbon dioxide into the atmosphere. Thus, the roughly 1 million bodies that are cremated annually in the United States produce ~270,000 tons of carbon dioxide. That's more CO₂ pollution than 22,000 average American homes generate in a year.^[58] The environmental impact may be reduced by using cremators for longer periods, and not cremating on the same day as the coffin is received, which reduces the use of fossil fuel and hence carbon emissions. Cremation is therefore becoming more friendly toward the environment^[59] though natural burials are also possible. Some funeral and crematorium owners offer a carbon neutral funeral service incorporating efficient-burning coffins made from lightweight recycled composite board.^[60]

Another environmental concern is that traditional burial takes up a great deal of space. In a traditional burial, the body is buried in a casket made from a variety of materials. In the United States, the casket is often placed inside a concrete vault or liner before burial in the ground. While individually this may not take much room, combined with other burials, it can over time cause serious space concerns. Many cemeteries, particularly in Japan^[61] and Europe as well as those in larger cities, have run out of permanent space. In Tokyo, for example, traditional burial plots are extremely scarce and expensive,^[62] and in London, a space crisis led Harriet Harman to propose reopening old graves for "double-decker" burials.^[63]

Some cities in Germany do not have plots for sale, only for lease. When the lease expires, the remains are disinterred and a specialist bundles the bones, inscribes the forehead of the skull with the information that was on the headstone, and places the remains in a special crypt.

Religious views on cremation

Christianity

In Christian countries and cultures, cremation has historically been discouraged, but now in many denominations it is accepted.^[64]

Catholicism

Christians preferred to bury the dead rather than to cremate the remains, as was common in Roman culture. The Roman catacombs and veneration of relics of saints witness to this preference. For them, the body was not a mere receptacle for a spirit that was the real person, but an integral part of the human person.^[65] They looked on the body as sanctified by the sacraments^[66] and itself the temple of the Holy Spirit,^[67] and thus requiring to be disposed of in a way that honours and reveres it, and they saw many early practices involved with disposal of dead bodies as pagan in origin or an insult to the body;^[68]

The idea that cremation might interfere with God's ability to resurrect the body was refuted as early as the 2nd-century *Octavius* of Minucius Felix, in which he said: "Every body, whether it is dried up into dust, or is dissolved into moisture, or is compressed into ashes, or is attenuated into smoke, is withdrawn from us, but it is reserved for God in the custody of the elements. Nor, as you believe, do we fear any loss from sepulture, but we adopt the ancient and better custom of burying in the earth."^[69] And while there was a clear preference for burial, there was no general Church law forbidding cremation until 1866. Even in Medieval Europe, cremation was practiced in situations where there were multitudes of corpses simultaneously present, such as after a battle, after a pestilence or famine, and where there was an imminent fear of diseases spreading from the corpses, since individual burials with digging graves would take too long and body decomposition would begin before all the corpses had been interred.

Beginning in the Middle Ages, and even more so in the 18th century and later, rationalists and classicists began to advocate cremation again as a statement denying the resurrection and/or the afterlife,^[70] although the pro-cremation movement more often than not took care to address and refute theological concerns about cremation in their works.^[71] Sentiment within the Catholic Church against cremation became hardened in the face of the association of cremation with "professed enemies of God."^[71] When some Masonic groups advocated cremation as a means of rejecting Christian belief in the resurrection, the Holy See forbade Catholics to practice cremation in 1886. The 1917 Code of Canon Law incorporated this ban, but in 1963, recognizing that, in general, cremation was being sought for practical purposes and not as a denial of bodily resurrection, the choice of cremation was permitted in many circumstances.^{[72][73]} The current 1983 Code of Canon Law, states: "The Church earnestly recommends the pious custom of burial be retained; but it does not forbid cremation, unless this is chosen for reasons which are contrary to Christian teaching."^[74]

There are no universal rules governing Catholic funeral rites in connection with cremation, but episcopal conferences have laid down rules for various countries.^[72] Of these, perhaps the most elaborate are those established, with the necessary confirmation of the Holy See, by the United States Conference of Catholic Bishops and published as Appendix II of the United States edition of the *Order of Christian Funerals*.^{[75][76]}

Although the Holy See has in some cases authorized bishops to grant permission for funeral rites to be carried out in the presence of cremated remains, it is preferred that the rites be carried out before cremation, in the presence of the still intact body. Practices that show insufficient respect for the ashes of the dead such as turning them into jewelry or scattering them are forbidden for Catholics.^[72]

Anglicanism and Lutheranism

In 1917, *Volume 6 of the American Lutheran Survey* stated that "The Lutheran clergy as a rule refuse" and that "Episcopal pastors often take a stand against it."^[77] Indeed, in the 1870s, the Anglican Bishop of London stated that the practice of cremation would "undermine the faith of mankind in the doctrine of the resurrection of the body, and so bring about a most disastrous social revolution."^[78] In *The Lutheran Pastor*, George Henry Gerberding stated:

As to cremation, This is not a Biblical or Christian mode of disposing of the dead. The Old and New Testament agree and take for granted that as the body was taken originally from the earth, so it is to return to the earth again. Burial is the natural and Christian mode. There is a beautiful symbolism in it. The whole terminology of eschatology presupposes it. Cremation is purely heathenish. it was the practice among the Greeks and Romans. The mass of the Hindus thus dispose of their dead. It is dishonoring to the body, intended for a temple of the Holy Ghost and to bear the image of God. It is an insidious denial of the doctrine of the resurrection.^[79]

However, Protestant churches welcomed the use of cremation at a much earlier date than the Catholic Church; pro-cremation sentiment was not unanimous among Protestants, however.^[80] The first crematoria in the Protestant countries were built in the 1870s, and in 1908, the Dean and Chapter of Westminster Abbey—one of the most famous Anglican churches—required that remains be cremated for burial in the abbey's precincts.^[81] Today, "scattering", or "strewing," is an acceptable practice in many Protestant denominations, and some churches have their own "garden of remembrance" on their grounds in which remains can be scattered. Other groups also support cremation. Some denominations, like Lutheran churches in Scandinavia, favour the urns being buried in family graves. A family grave can contain urns of many generations and also the urns of spouses and loved ones.

Methodism

An early Methodist tract titled *Immortality and Resurrection* noted that "burial is the result of a belief in the resurrection of the body, while cremation anticipates its annihilation."^[82] *The Methodist Review* noted that "Three thoughts alone would lead us to suppose that the early Christians would have special care for their dead, namely, the essential Jewish origin of the Church; the mode of burial of their founder; and the doctrine of the resurrection of the body, so powerfully urged by the apostles, and so mighty in its influence on the primitive Christians. From these considerations, the Roman custom of cremation would be most repulsive to the Christian mind."^[83]

Eastern Orthodox and others who forbid cremation

On the other hand, some branches of Christianity oppose cremation, including some minority Protestant groups and Orthodox.^[84] Most notably, the Eastern Orthodox and Oriental Orthodox Churches forbid cremation, as a custom, but not dogmatically. Exceptions are made for circumstances where it may not be avoided (when civil authority demands it, or epidemics) or if it may be sought for good cause, but when a cremation is willfully chosen for no good cause by the one who is deceased, he or she is not permitted a funeral in the church and may also be permanently excluded from liturgical prayers for the departed. In Orthodoxy, cremation is perceived by some a rejection of the dogma of the general resurrection.^[85]

The Church of God (Restoration) also forbids the practice of cremation, believing it to be a pagan practice.^[86]

The Church of Jesus Christ of Latter-day Saints

The Church of Jesus Christ of Latter-day Saints (LDS Church) has, in past decades, discouraged cremation without expressly forbidding it. In the 1950s, for example, Apostle Bruce R. McConkie^[87] wrote that "only under the most extraordinary and unusual circumstances" would cremation be consistent with LDS teachings.

However, more recent LDS publications have provided instructions for how to dress the deceased when they have received their temple endowments (and thus wear temple garments) prior to cremation for those wishing to do so, or in countries where the law requires cremation. Except where required by law, the family of the deceased may decide whether the body should be cremated, though the Church "does not normally encourage cremation."^[88]

Hinduism and other Indian origin religions

Religions such as Hinduism, Buddhism, Jainism, and Sikhism practice cremation. The founder, Shakyamuni Buddha was cremated. For Buddhist spiritual masters who are cremated, one of the results of cremation are the formation of Buddhist relics.

A dead adult Hindu is mourned with a cremation, while a dead child is typically buried.^{[89][90]} The rite of passage is performed in harmony with the Hindu religious view that the microcosm of all living beings is a reflection of a macrocosm of the universe.^[91] The soul (Atman, Brahman) is the essence and immortal that is released at the *Antyeshhti* ritual, but both the body and the universe are vehicles and transitory in various schools of Hinduism. They consist of five elements - air, water, fire, earth and space.^[91] The last rite of passage returns the body to the five elements and origins.^{[89][91][92]} The roots of this belief are found in the Vedas, for example in the hymns of Rigveda in section 10.16, as follows,



Burning ghats of Manikarnika, at Varanasi, India

Burn him not up, nor quite consume him, Agni: let not his body or his skin be scattered,
 O all possessing Fire, when thou hast matured him, then send him on his way unto the Father
 When thou hast made him ready, all possessing Fire, then do thou give him over to the Father
 When he attains unto the life that waits him, he shall become subject to the will of gods
 The Sun receive thine eye, the Wind thy *Prana* (life-principle, breath) — *Ṛgveda*, 10.16, 1-5, to
 earth or heaven.
 Go, if it be thy lot, unto the waters; go, make thine home in plants w

— *Rigveda* 10.16^[93]

The final rites, in case of untimely death of a child, is usually not cremation but a burial. This is rooted in *Rig Veda*'s section 10.18, where the hymns mourn the death of the child, praying to deity *Mṛityu* to "neither harm our girls nor our boys", and pleads the earth to cover, protect the deceased child as a soft wool.^[94]

Sati

The act of *sati* refers to a funeral ritual in which a widowed woman committed suicide on the husband's funeral pyre. While a mention of self-immolation by one of several wives of an Indian king is found in a Greek text on India, along with self-immolation by widows in Russia near Volga, tribes of Thracians in southeast Europe, and some tribes of Tonga and Fiji islands, vast majority of ancient texts do not mention this practice.^{[95][96]} Rare mentions of such cremations in aristocratic circles appear in texts dated to be before the 9th century AD, where the widow of a king had the choice to burn with him or abstain.^{[95][96]} Ancient texts of Hinduism make no mention of Sati; its early medieval era texts forbid it, while post 10th century medieval era texts partly justify it and criticize the practice.^[96] The practice of sati, grew after 1000 CE, becoming a particularly significant practice by Hindus in India during the Islamic wars of conquest in South Asia.^{[95][97][98]}

This practice was made illegal in 1829 during the British colonial rule of India.^[99] After gaining independence from British colonial era, India passed a series of additional laws. The Indian Sati Prevention Act from 1988 further criminalised any type of aiding, abetting, and glorifying of *sati*.^[100] In modern India, the last known case of Sati was in 1987, by Roop Kanwar in Rajasthan. Her action was found to be a suicide, and it led to the arrest and prosecution of people for failing to act and prevent her suicide during her husband's cremation.^{[101][102]}

Bali

Balinese Hindu dead are generally buried inside the container for a period of time, which may exceed one month or more, so that the cremation ceremony (*Ngaben*) can occur on an auspicious day in the Balinese-Javanese Calendar system ("Saka"). Additionally, if the departed was a court servant, member of the court or minor noble, the cremation can be postponed up to several years to coincide with the cremation of their Prince. Balinese funerals are very expensive and the body may be interred until the family can afford



Pashupatinath, Nepal



A Hindu cremation rite in Nepal. The *samskara* above shows the body wrapped in saffron red on a pyre.

it or until there is a group funeral planned by the village or family when costs will be less. The purpose of burying the corpse is for the decay process to consume the fluids of the corpse, which allows for an easier, more rapid and more complete cremation.

Islam

Islam strictly forbids cremation.^[103] Islam has specific rites for the treatment of the body after death.^[104]

Judaism

Judaism traditionally disapproved of cremation in the past (it was the traditional means of disposing the dead in the neighboring Bronze Age cultures). It has also disapproved of preservation of the dead by means of embalming and mummifying,^{[105][106]} a practice of the ancient Egyptians. During the 19th and early 20th centuries, as the Jewish cemeteries in many European towns had become crowded and were running out of space, cremation became an approved means of corpse disposal amongst the liberal Jews. Current liberal movements like Reform Judaism still support cremation, although burial remains the preferred option.^{[54][107]}

The Ultra-Orthodox Hasidic Jews have maintained a stricter line on cremation, and disapprove of it as Halakha (Jewish law) forbids it. This halakhic concern is grounded in the upholding of bodily resurrection as a core belief of traditional Judaism, as opposed to other ancient trends such as the Sadducees, who denied it. Some Conservative Jewish groups also oppose cremation.^{[108][109]}

In Israel there were no formal crematories until 2004 when B&L Cremation Systems Inc. became the first crematory manufacturer to sell a retort to Israel. In August 2007, an orthodox youth group in Israel was accused of burning down the country's sole crematorium.^[110] The crematorium was rebuilt within weeks by its owner Aley Shalechet, and the retort replaced. Since that incident, cremation has taken place in Israel without interruption.

Other

Baha'i

The Baha'i Faith forbids cremation, "He feels that, in view of what 'Abdu'l-Bahá has said against cremation, the believers should be strongly urged, as an act of faith, to make provisions against their remains being cremated. Bahá'u'lláh has laid down as a law, in the Aqdas, the manner of Bahá'í burial, and it is so beautiful, befitting and dignified, that no believer should deprive himself of it."

Zoroastrianism

Traditionally, Zoroastrianism disavows cremation or burial to preclude pollution of fire or earth. The traditional method of corpse disposal is through ritual exposure in a "Tower of Silence", but both burial and cremation are increasingly popular alternatives. Some contemporary adherents of the faith have opted for cremation. Parsi-Zoroastrian singer Freddie Mercury of the group Queen was cremated after his death.

China

Neo-Confucianism under Zhu Xi strongly discourages cremation of one's parents' corpses as unfilial. Han

Chinese traditionally practiced burial and viewed cremation as taboo and as a barbarian practice.

Traditionally, only Buddhist monks in China exclusively practiced cremation because ordinary Han Chinese detested cremation, refusing to do it. But now, the atheist Communist party enforces a strict cremation policy on Han Chinese. However, exceptions are made for Hui who do not cremate their dead due to Islamic beliefs.^[111]

The minority Jurchen and their Manchu descendants originally practiced cremation as part of their culture. They adopted the practice of burial from the Han, but many Manchus continued to cremate their dead.^[112]

Pet cremation

Pet cremation is practiced internationally. For example, in Japan, more than 465 companion animal temples are in operation. These venues hold funerals and rituals for lost pets. Although in current-day Australia, pet owners could purchase services to have their companion animal cremated and placed in a pet cemetery or taken home. They can also have them come to remove the animals body from the home themselves to take to a crematorium to be cremated.^[113]

The cost of pet cremation depends on location, where the cremation is done, and time of cremation. The American Humane Society's cost for cremation of 22.5 kg (50 lb). or less pet is \$110 while 23 kg (51 lb). or more is \$145. The cremated remains are available for the owner to pick up in seven to ten business days. Urns for the companion animal range from \$50 to \$150.^[114]

Controversial cases of cremation in recent history

The Tri-State Crematory Incident

In early 2002, 334 corpses that were supposed to have been cremated in the previous few years at the Tri-State Crematory were found intact and decaying on the crematorium's grounds in the U.S. state of Georgia, having been dumped there by the crematorium's proprietor. Many of the corpses were decayed beyond identification. Some families received "ashes" that were made of wood and concrete dust.

Operator Ray Brent Marsh had 787 criminal charges filed against him. On November 19, 2004, Marsh pleaded guilty to all charges. Marsh was sentenced to two 12-year prison sentences, one each from Georgia and Tennessee, to be served concurrently; he was also sentenced to probation for 75 years following his incarceration.

Civil suits were filed against the Marsh family as well as a number of funeral homes who shipped bodies to Tri-State; these suits were ultimately settled. The property of the Marsh family has been sold, but collection of the full \$80-million judgment remains doubtful. Families have expressed the desire to return the former Tri-State crematory to a natural, parklike setting.

The Indian Ocean tsunamis

The magnitude 9.0–9.3 2004 Indian Ocean earthquake triggered a series of lethal tsunamis on December 26, 2004 that killed almost 300,000 people, making them the deadliest tsunamis in recorded history. The tsunamis killed people over an area ranging from the immediate vicinity of the quake in Southeast Asia

(Indonesia, Thailand, and the northwestern coast of Malaysia), to thousands of kilometers away in the Indian subcontinent (Bangladesh, India, Sri Lanka, the Maldives), the Horn of Africa (Somalia), and the African Great Lakes (Kenya and Tanzania).

Authorities had difficulties dealing with the large numbers of bodies, and as a result, thousands of bodies were cremated together out of fear that decaying bodies would cause disease. Many of these bodies were not identified or viewed by relatives prior to cremation. A particular point of objection was that the bodies of Westerners were kept separate from those of Asian descent, who were mostly locals. This meant that the bodies of tourists from other Asian nations, such as Japan and South Korea, were mass cremated, rather than being returned to their country of origin for funeral rites.

Obesity and crematorium safety

In Austria in April 2012, the body of a large 200 kg (440 lb) woman caught fire, clogging the crematory's air filters and almost destroying the entire facility. Because of this incident and the potential for further incidents, a number of new crematoria like the B&L Cremation Systems model Phoenix II-1 are being built to hold individuals weighing up to 450 kg. (1000 lb).^[21]

Rates

The cremation rate varies considerably across countries with Japan reporting a 99% cremation rate while Poland reported a rate of 6.7% in 2008.^[115] Cremation accounts for about 20% of the \$13.4 billion funeral industry in the U.S.^[21]

See also

- Antyesti
- Burial at sea
- Crematory
- Burial in space
- Funeral pyre
- Death
- Funeral
- Holocaust
- Jeanette Pickersgill
- Promession
- Resomation
- Sati
- Self-immolation
- Tissue digestion
- William Price

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Crematory

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A **crematory** (also known as a **crematorium**, **cremator** or **retort**) is a machine in which people's bodies or remains are burned down to the bones, eliminating all soft tissue. Crematories are usually found in funeral homes, chapels, cemeteries, or in stand-alone facilities. A facility which houses the actual crematory units is referred to as a **crematorium**.

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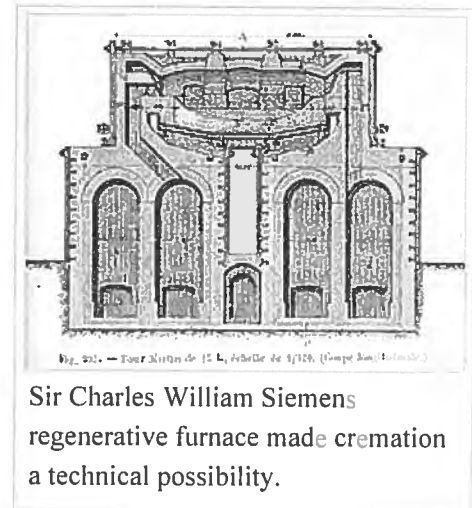
History

Prior to the Industrial Revolution, any cremation which took place was on an outdoor, open pyre. With firewood, and to a lesser extent, coal being the only available fuel options and the low energy efficiency inherent in such a configuration, it is no surprise that cremation enjoyed minimal popularity in densely populated areas up until furnace technology developed during the Industrial Revolution could be applied to cremation to make it more practical in an urbanizing world.

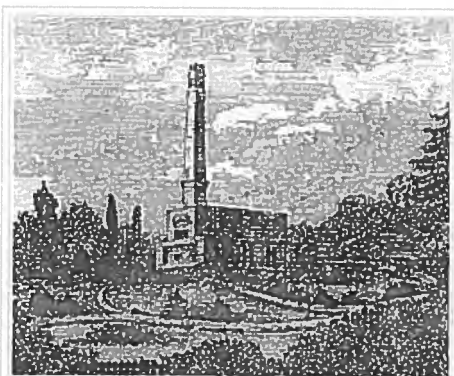
The first modern crematory

The organized movement to reinstate cremation as a viable method for body disposal began in the 1870s. In 1869 the idea was presented to the Medical International Congress of Florence by Professors Coletti and Castiglioni "in the name of public health and civilization". In 1873, Professor Paolo Gorini of Lodi and Professor Ludovico Brunetti of Padua published reports or practical work they had conducted.^[1] A model of Brunetti's cremating apparatus, together with the resulting ashes, was exhibited at the Vienna Exposition in 1873 and attracted great attention, including that of Sir Henry Thompson, 1st Baronet, a surgeon and Physician to the Queen Victoria, who returned home to become the first and chief promoter of cremation in England.^[2]

Meanwhile, Sir Charles William Siemens had developed his regenerative furnace in the 1850s. His furnace operated at a high temperature by using regenerative preheating of fuel and air for combustion. In regenerative preheating, the exhaust gases from the furnace are pumped into a chamber containing bricks, where heat is transferred from the gases to the bricks. The flow of the furnace is then reversed so that fuel and air pass through the chamber and are heated by the bricks. Through this method, an open-hearth furnace can reach temperatures high enough to melt steel, and this process made cremation an efficient and practical proposal. Charles's nephew, Carl Friedrich von Siemens perfected the use of this furnace for the incineration of organic material at his factory in Dresden. The radical politician, Sir Charles Wentworth Dilke, took the corpse of his dead wife there to be cremated in 1874. The efficient and cheap process brought about the quick and complete incineration of the body and was a fundamental technical breakthrough that finally made industrial cremation a practical possibility.^[3]



Sir Charles William Siemens regenerative furnace made cremation a technical possibility.



The Woking Crematorium, built in 1878 as the first facility in England after a long campaign led by the Cremation Society of Great Britain.

Sir Henry Thompson's main reason for supporting cremation was that "it was becoming a necessary sanitary precaution against the propagation of disease among a population daily growing larger in relation to the area it occupied". In addition, he believed, cremation would prevent premature burial, reduce the expense of funerals, spare mourners the necessity of standing exposed to the weather during interment, and urns would be safe from vandalism.^[2] On 13 January 1874, some advocates of cremation, including Anthony Trollope, John Everett Millais, George du Maurier, Thomas Spencer Wells, John Tenniel and Shirley Brooks,^[4] held a meeting at Thompson's house in London and formally founded the Cremation Society of Great Britain which was "organised expressly for the purpose of obtaining and disseminating information on the subject and for adopting the best method of performing the process, as soon as this could be

determined, provided that the act was not contrary to Law".^[2]

The first duty of the Cremation Society was to ascertain whether cremation could be legally performed in the country, and then to construct a first crematorium.^[2] In 1878, a piece of land in Woking on which the crematorium was to be established was bought by Sir Henry Thompson.^[5] Professor Gorini was invited to visit Woking and supervise the erection of his cremation apparatus there.

In 1885, the first official cremation in the UK took place in Woking. The deceased was Mrs Jeannette C. Pickersgill, a well-known figure in literary and scientific circles.^[6] By the end of the year, the Cremation Society of Great Britain had overseen two more cremations, a total of 3 out of 597,357 deaths in the UK that year.^[5] In 1886 ten bodies were cremated at Woking Crematorium. During 1888, in which 28

cremations took place, the Cremation Society planned to provide a chapel, waiting rooms and other amenities there. In 1892 a crematorium opened in Manchester, followed by one in Glasgow in 1895, Liverpool in 1896 and Birmingham Crematorium in 1903.^[7]

Crematoria in Europe were built in 1878 in the town of Gotha in Germany and later in Heidelberg in 1891. The first modern crematory in the U.S. was built in 1876 by Francis Julius LeMoyne after hearing about its use in Europe.

During that time it was thought that people were getting sick by attending funerals of those recently deceased and that decomposing bodies were leaking into the water systems.

^{[8][9]} LeMoyne built the crematory to cremate bodies in a controlled environment primarily for sanitary reasons.

Cremation was used to destroy any organic matter that could cause illness and give families a better way to preserve ashes. Before LeMoyne's crematory closed in 1901, it had performed 42 cremations.^[10]

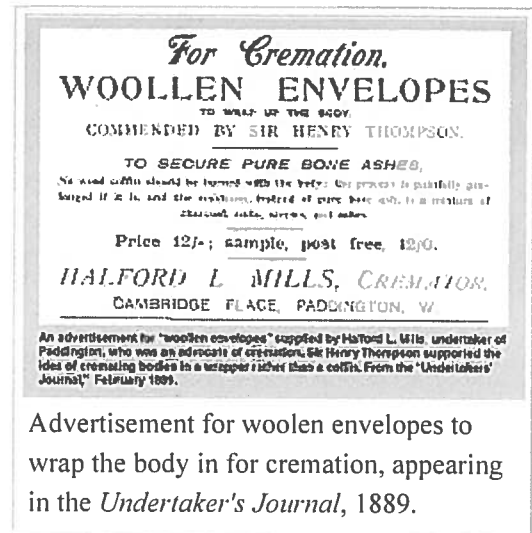
Some of the various Protestant churches came to accept cremation, with the rationale being, "God can resurrect a bowl of ashes just as conveniently as he can resurrect a bowl of dust." The 1908 Catholic Encyclopedia was critical about these efforts, referring to them as a "sinister movement" and associating them with Freemasonry, although it said that "there is nothing directly opposed to any dogma of the Church in the practice of cremation."^[11] In 1963, Pope Paul VI lifted the ban on cremation,^[12] and in 1966 allowed Catholic priests to officiate at cremation ceremonies.

In the U.S. only about one crematory per year were built in the late 19th century. As embalming became more widely accepted and used, crematories lost their sanitary edge. To not be left behind, crematories had an idea of making cremation beautiful. They started building crematories with stained-glass windows and marble floors with frescoed walls. By 2008, the cremation rate was 36.2% and was growing about 1 percentage point a year, according to CANA. CANA is the largest organization representing crematories and funeral homes in the U.S. and Canada.^[10]

Australia also started to establish modern cremation movements and societies. Australians had their first purpose-built modern crematorium and chapel in the West Terrace Cemetery in the South Australian capital of Adelaide in 1901. This small building, resembling the buildings at Woking, remained largely unchanged from its 19th-century style and was in full operation until the late 1950s. The oldest operating crematorium in Australia is at Rookwood Cemetery, in Sydney. It opened in 1925.

In the Netherlands, the foundation of the Association for Optional Cremation^[13] in 1874 ushered in a long debate about the merits and demerits of cremation. Laws against cremation were challenged and invalidated in 1915 (two years after the construction of the first crematorium in the Netherlands), though cremation did not become legally recognised until 1955.^[14]

Technology



Advertisement for woolen envelopes to wrap the body in for cremation, appearing in the *Undertaker's Journal*, 1889.

While open outdoor pyres were used in the past and are often still used in many areas of the world today, notably India, most cremation in industrialized nations takes place within enclosed furnaces designed to maximize utilization of the thermal energy consumed while minimizing the emission of smoke and odors.

Thermodynamics

A human body usually contains a negative caloric value, meaning that energy is *required* to combust it. This is a result of the high water content; all water must be vaporized which requires a very large amount of thermal energy.

A 68 kg (150 lbs) body which contains 65% water will require 100 MJ of thermal energy before any combustion will take place. 100 MJ is approximately equivalent to 32 m³ (105 ft³) of natural gas, or 3 liters of fuel oil (0.8 US gallons). Additional energy is necessary to make up for the heat capacity ("preheating") of the furnace, fuel burned for emissions control, and heat losses through the insulation and in the flue gases.

As a result, crematories are most often heated by burners fueled by natural gas. LPG (propane/butane) or fuel oil may be used where natural gas is not available. These burners can range in power from 150 kW (0.5 MMBTU/h) to over 400 kW (1.5 MMBTU/h).

Crematories heated by electricity also exist in India, where electric heating elements bring about cremation without the direct application of flame to the body.

Coal, coke, and wood were used in the past, heating the chambers from below (like a cooking pot). This resulted in an indirect heat and prevented mixing of ash from the fuel with ash from the body. The term *retort* when applied to cremation furnaces originally referred to this design.

There has been interest, mainly in developing nations, to develop a crematory heated by concentrated solar energy.^[15] Another new design starting to find use in India, where wood is traditionally used for cremation, is a crematory based around a wood gas fired process. Due to the manner in which the wood gas is produced, such crematories use only a fraction of the required wood; and according to multiple sources, have far less impact on the environment than traditional natural gas or fuel oil processes.^[16]

Combustion system

A typical unit contains a primary and secondary combustion chamber. These chambers are lined with a refractory brick designed to withstand the high temperatures.



West London Crematorium



Doi-saien (Japan)

The primary chamber contains the body – one at a time usually contained in some type of combustible casket or container. This chamber has at least one burner to provide the heat which vaporizes the water content of the body and aids in combustion of the organic portion. A large door exists to load the body container. Temperature in the primary chamber is typically between 760 and 1150 °C (1400 to 2100 °F). Higher temperatures speed cremation but consume more energy, generate more oxides of nitrogen, and accelerate spalling of the furnace's refractory lining.

The secondary chamber may be at the rear or above the primary chamber. A secondary burner(s) fires into this chamber, oxidizing any organic material which passes from the primary chamber. This acts as a method of pollution control to eliminate the emission of odors and smoke. The secondary chamber typically operates at a temperature greater than 900 °C (1650 °F).

Air pollution control and energy recovery

The flue gases from the secondary chamber are usually vented to the atmosphere through a refractory-lined flue. They are at a very high temperature, and interest in recovering this thermal energy e.g. for space heating of the funeral chapel, or other facilities or for distribution into local district heating networks has arisen in recent years. Such heat recovery efforts have been viewed in both a positive and negative light by the public.^[17]

In addition, filtration systems (baghouses) are being applied to crematories in many countries. Activated carbon adsorption is being considered for mercury abatement (as a result of dental amalgam). Much of this technology is borrowed from the waste incineration industry on a scaled-down basis. With the rise in the use of cremation in Western nations where amalgam has been used liberally in dental restorations, mercury has been a growing concern.

Automation

The application of computer control has allowed the crematory to be more automated, in that temperature and oxygen sensors within the unit along with pre-programmed algorithms based upon the weight of the deceased allow the unit to operate with less user intervention. Such computer systems may also streamline recordkeeping requirements for tracking, environmental, and maintenance purposes.

Additional aspects

- Cremation time

The time to carry out a cremation can vary from 70 minutes to 210 minutes. Crematories used to run on timers (some still do) and one would have to determine the weight of the body therefore calculating how long the body has to be cremated for and set the timers accordingly. Other types of crematories merely have a start and a stop function for the cremation, displayed on the user interface. The end of the cremation must be judged by the operator who in turn stops the cremation process.^{[18][19]}

See also

- Cremation

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 - YouTube Crematory of Japan (https://www.youtube.com/watch?v=GQ67Obn_o4I&feature=channel_video_title)

External links

- Crematoria in Europe (<http://www.crematorium.eu>)

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Categories: Death customs | Undertaking | Cremation | Crematoria

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