CONTRACT

THIS CONTRACT is between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and MICHIGAN RECREATIONAL CONSTRUCTION, INC ("Contractor") a(n) Michigan corporation located at 1091 VICTORY DR, Howell, Michigan 48843.

Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled **Bicentennial Park Splash Pad and Playground Improvement Project – Phase 1A** in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, all of which are incorporated as part of this Contract:

Non-discrimination and Living Wage Declaration of Compliance Forms (if applicable) Vendor Conflict of Interest Form Prevailing Wage Declaration of Compliance Form (if applicable) Bid Forms Contract and Exhibits Bonds General Conditions Standard Specifications Detailed Specifications Plans Addenda

ARTICLE II - Definitions

Administering Service Area/Unit means Community Services / Parks and Recreation.

Project means Bicentennial Park Splash Pad and Playground Improvement Project – Phase 1A

Supervising Professional means the person acting under the authorization of the manager of the Administering Service Area/Unit. At the time this Contract is executed, the Supervising Professional is: **Adam Fercho** whose job title is **Landscape Architect Capital Project Manager**. If there is any question concerning who the Supervising Professional is, Contractor shall confirm with the manager of the Administering Service Area/Unit.

Contractor's Representative means Craig A Sheffer whose job title is President.

ARTICLE III - Time of Completion

(A) The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.

- (B) The entire work for this Contract shall be completed within two hundred and fifty (250) consecutive days.
- (C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to \$500 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

ARTICLE IV - The Contract Sum

- (A) The City shall pay to the Contractor for the performance of the Contract, the unit prices as given in the Bid Form for the estimated bid total of: one million two hundred seventy thousand three hundred twenty-two and 00/100 dollars (\$1,270,322.00).
- (B) The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the Contract Documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract may not be assigned or subcontracted any portion of any right or obligation under this contract without the written consent of the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under this contract unless specifically released from the requirement, in writing, by the City.

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this Contract, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract. The parties stipulate that the venue referenced in this Contract is for convenience and waive any claim of non-convenience.

Whenever possible, each provision of the Contract will be interpreted in a manner as to be effective and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the Contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a Contract of employment but is a Contract to accomplish a specific result. Contractor is an independent Contractor performing services for the City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any Contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this Contract.

ARTICLE VIII - Notice

All notices given under this Contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the Contract Documents or other address the Contractor may specify in writing. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; or (2) three days after mailing certified U.S. mail.

ARTICLE IX - Indemnification

To the fullest extent permitted by law, Contractor shall indemnify, defend and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this Contract, by the Contractor or anyone acting on the Contractor's behalf under this Contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence. The provisions of this Article shall survive the expiration or earlier termination of this contract for any reason.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations, negotiations, agreements, or understandings whether written or oral. Neither party has relied on any prior representations in entering into this Contract. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Contract, regardless of the other party's failure to object to such form. This Contract shall be binding on and shall inure to the benefit of the parties to this Contract and their permitted successors and permitted assigns and nothing in this Contract, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

ARTICLE XI – Electronic Transactions

The City and Contractor agree that signatures on this Contract may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Contract. This Contract may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

[Signatures are on the Following Page]

MICHIGAN RECREATIONAL CONSTRUCTION INC

CITY OF ANN ARBOR

Зу:		Ву:	
Name:	Craig A Sheffer	Name:	Milton Dohoney Jr.
Title:	President	Title:	City Administrator
Date:		Date:	
		Approve	ed as to substance:
		Ву:	
		Name:	Derek Delacourt
		Title:	Community Services Area Administrator
		Date:	
		Approve	ed as to form:
		Ву:	
		Name:	Atleen Kaur
		Title:	City Attorney
		Date:	

(Signatures continue on following page)

PERFORMANCE BOND

	(referred to as	
corporation duly authorized "Surety"), are bound to the , the payment of which Pri administrators, successors a	to do business in the State of Michigan (referred to as City of Ann Arbor, Michigan (referred to as "City"), for \$ ncipal and Surety bind themselves, their heirs, executors, and assigns, jointly and severally, by this bond. written Contract with the City entitled	
Act No. 213 of the Michigan I Whenever the Principal is d	and this bond is given for that Contract in compliance with Public Acts of 1963, as amended, being MCL 129.201 et seq. eclared by the City to be in default under the Contract, the y the default or shall promptly:	
(a) complete the Contract in	accordance with its terms and conditions; or	
accordance with its terms an responsible bidder, arrange available, as work progress balance of the Contract price which Surety may be liable in Surety shall have no obligate under the Contract. Surety agrees that no change Contract or to the work to be it shall in any way affect its change, extension of time, work, or to the specifications Principal, Surety, and the delectronically in lieu of an original signatures that binds	for submission to the City for completing the Contract in d conditions, and upon determination by Surety of the lowest for a Contract between such bidder and the City, and make es, sufficient funds to pay the cost of completion less the e; but not exceeding, including other costs and damages for hereunder, the amount set forth in paragraph 1. Ition to the City if the Principal fully and promptly performs e, extension of time, alteration or addition to the terms of the experformed thereunder, or the specifications accompanying sobligations on this bond, and waives notice of any such alteration or addition to the terms of the Contract or to the city agree that signatures on this bond may be delivered riginal signature and agree to treat electronic signatures as them to this bond. This bond may be executed and delivered delivery, the facsimile signature will be deemed to have the	
same effect as if the original signature had been delivered to the other party.		
ED AND SEALED this	_ day of, 202	
e of Surety Company)	(Name of Principal)	
• • • • • • • • • • • • • • • • • • • •	By	
ignature)		
	(Signature)	
e of Office)	Its (Title of Office)	
ved as to form:	Name and address of agent:	
Kaur, City Attorney	_	
	"Surety"), are bound to the the high the payment of which Pri administrators, successors at The Principal has entered a	

LABOR AND MATERIAL BOND

(1)	(1)	_			
	of	(referred to			
	as "Principal"), and	, a corporation			
	duly authorized to do business in the State of Michigan, (referred to as "Su	rety"), are bound			
	to the City of Ann Arbor, Michigan (referred to as "City"), for the use and be	nefit of claimants			
	as defined in Act 213 of Michigan Public Acts of 1963, as amended, being	MCL 129.201 <u>et</u>			
	<u>seq</u> ., in the amount of				
	\$, for the payment of which Principal and Surety bind	themselves, their			
	heirs, executors, administrators, successors and assigns, jointly and severa	lly, by this bond.			
(2)	(2) The Principal has entered a written Contract with the Cityentitled				
	, for RFP No	; and this bond is			
	given for that Contract in compliance with Act No. 213 of the Michigan Public	c Acts of 1963 as			
	amended;				
(3)	(3) If the Principal fails to promptly and fully repay claimants for labor and ma	terial reasonably			
	required under the Contract, the Surety shall pay those claimants.				
(4)	(4) Surety's obligations shall not exceed the amount stated in paragraph 1, and	Surety shall have			
	no obligation if the Principal promptly and fully pays the claimants.	no obligation if the Principal promptly and fully pays the claimants.			
(5)	(5) Principal, Surety, and the City agree that signatures on this bond m	ay be delivered			
	electronically in lieu of an original signature and agree to treat electronic signatures as original				
	signatures that bind them to this bond. This bond may be executed and delivered by facsimile				
	and upon such delivery, the facsimile signature will be deemed to have the same effect as if				
the original signature had been delivered to the other party.					
SIG	SIGNED AND SEALED this day of, 202_				
•	(Name of Surety Company) (Name of Principal)				
Ву	By By				
	(Signature)				
	Its Its Its				
((Title of Office) (Title of Office)				

Approved as to form:	Name and address of agent:
Atleen Kaur, City Attorney	

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the City and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Bid.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the City upon discovery, and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of

subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section.

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate compliance with the prevailing wage requirements. A sample Prevailing Wage Form is provided in the Appendix herein for reference as to what will be expected from contractors. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Contract a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Contract are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor's employees who perform work on this contract.

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of Title IX of the Ann Arbor City Code, and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or

employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be

executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

- (1) When work under an extra work order is added to the work under this Contract;
- (2) When the work is suspended as provided in Section 20;
- (3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;
- (4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;
- (5) Delay due to an act of Government;
- (6) Delay by the Supervising Professional in the furnishing of plans and necessary information;
- (7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section I3. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

- (1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;
- (2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;
- (3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;
- (4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
- (5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 180 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within I0 days after written notice, the City may remove them and, if the removed material has value, may store the material

at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

- (1) The consent of the surety to payment of the final estimate;
- (2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

- (1) unsettled liens;
- (2) faulty work appearing within 12 months after final payment;
- (3) hidden defects in meeting the requirements of the plans and specifications;
- (4) manufacturer's quarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the

written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

- (1) Defective work not remedied;
- (2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;
- (3) Failure of the Contractor to make payments properly to subcontractors or for material or labor:
- (4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

(1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of any work under this contract, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the required policies and endorsements. The certificates of insurance endorsements and/or copies of

policy language shall document that the Contractor satisfies the following minimum requirements. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

Required insurance policies include:

(a) Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

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Bodily Injury by Accident - $500,000 each accident
Bodily Injury by Disease - $500,000 each employee
Bodily Injury by Disease - $500,000 each policy limit
```

(b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. The following minimum limits of liability are required:

\$1,000,000	Each occurrence as respect Bodily Injury Liability or Property
	Damage Liability, or both combined.
\$2,000,000	Per Project General Aggregate
\$1,000,000	Personal and Advertising Injury
\$2,000,000	Products and Completed Operations Aggregate, which,
	notwithstanding anything to the contrary herein, shall be
	maintained for three years from the date the Project is completed.

- (c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
- (d) Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.
- (2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute

- with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.
- (3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and un-qualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company(s); name and address of the agent(s) or authorized representative(s); name(s), email address(es), and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which may be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) and all required endorsements to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.
 - (4) Any Insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.
 - (5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.
- (6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

- (1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
- (2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company authorized to transact business in Michigan and satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

Section 43

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during th	ie period	, 20, to	, 20
, performed any work, furnished any mate	erials, sustained any loss	damage or dela	ay, or otherwise
done anything in addition to the regular ite			
titled, f	or which I shall ask,	demand, sue	for, or claim
compensation or extension of time from			
compensation or extension of time as s			
declare that I have paid all payroll obligation			
the above period and that all invoices rela		ived more than 3	30 days prior to
this declaration have been paid in full exc	cept as listed below.		
There <u>is/is not</u> (Contractor please circle one <u>and</u> strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.			
Contractor	Date	_	
Ву			
(Signature)			
и			
(Title of Office)			
(Title of Office)			

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor,	, rep	resents that on ,
The undersigned Contractor, 20, it was awarded a contract by the	City of Ann Arbor, Mich	igan to under
the terms and conditions of a Contract ti	led	. The Contractor
represents that all work has now been ac	complished and the Co	ntract is complete.
•	•	·
The Contractor warrants and certifies tha	all of its indebtedness	arising by reason of the Contract
has been fully paid or satisfactorily secu	red; and that all claims	from subcontractors and others
for labor and material used in accomplis	ning the project, as wel	I as all other claims arising from
the performance of the Contract, have	een fully paid or satis	factorily settled. The Contractor
agrees that, if any claim should hereafte		responsibility for it immediately
upon request to do so by the City of Ann	Arbor.	
The Contractor, for valuable consideration		•
any and all claims or right of lien which the		, , ,
premises for labor and material used in the	ie project owned by the	City of Ann Arbor.
This affidavit is freely and voluntarily give	n with full knowledge o	f the facts
This amazir is neery and voluntarily give	ii wiiii iaii kilowicage o	Title facts.
Contractor	Date	_
By(Signature)		
(Signature)		
Its		
(Title of Office)		
(Title of Office)		
Subscribed and sworn to before me, on t	nis day of	20
	County, Mich	<u></u> , igan
Notary Public		3
County, MI		
My commission expires on:		

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Bid. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:

http://www.a2gov.org/departments/engineering/Pages/Engineering-and-Contractor-Resources.aspx

DETAILED SPECIFICATIONS

PHASING NARRATIVE

The Bicentennial Park Improvements Project involves the construction of a splash pad, replacement of existing swings and play structure, and renovation of the existing restroom building. Funding for this project is sourced from state earmarks, donations, park millage, and developer contributions; however, full project funding has not yet been secured. Therefore, the project has been divided into two phases: Phase 1A and Phase 1B.

This contract with Michigan Recreational Construction, Inc. covers Phase 1A only. Authorization for Phase 1B will be issued via a Change Order as additional funding becomes available. The contract documents, including the Plan Set, Proposal, and Detailed Specifications, outline the scope of work for both phases, as well as work to be performed by Park Operations staff.

Phase 1A, scheduled to begin in Spring 2025, includes site preparation, installation of the splash pad and playground equipment, renovation of the restroom facility, and underground utility work. This timeline is essential as a separate paving project at Bicentennial Park, funded by the American Recovery Plan Act (ARPA), will begin in Fall 2025. The paving project, which is not part of this contract, includes pathway and parking lot repaving, along with the installation of solar car ports.

Phase 1B will include concrete sidewalk and curb construction, installation of vinyl-coated fencing and shade sails, seeding of the bioretention area, and site restoration. Park Operations will handle vegetation clearing, pavilion improvements, and installation of site furnishings.

The splash pad, playground equipment, artificial turf, and shade sails were purchased in 2024 and are currently stored at the Wheeler Center on Stone School Road. Michigan Recreational Construction, Inc., selected for their extensive experience with splash pad construction, is aware of the project phasing and has provided separated unit pricing in their proposal. Michigan Recreational Construction, Inc. acknowledges that Phase 1B is contingent upon future funding being secured, and will not proceed until given formal authorization.

END OF SECTION

SECTION 01 25 00 MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 Work Included

Unless specifically indicated otherwise on the plans or in the contract documents, all materials and equipment shall be new and undamaged.

A. Materials and Equipment

- 1. Materials and equipment incorporated into the work shall conform to applicable specifications and standards. Materials and equipment shall comply with size, make, type, and quality specified or as specifically approved by the Engineer.
- 2. Manufactured and fabricated products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices. Like parts of duplicate units are to be manufactured to standard sizes and gauges to be interchangeable. Two or more items of the same kind shall be identical and manufactured by the same manufacturer. Products shall be suitable for the service conditions. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing. Materials or equipment shall not be used for any purpose other than that for which it is designed or specified.

1.02 Substitutions

- A. Where specific materials and equipment items are identified in the specifications by manufacturer's name or model number, bids shall be based on the products of one of the manufacturers so named or added thereto by addendum during the bidding period.
- B. During the bidding period, all requests for substitutions will be given full consideration by the Engineer; and if approved, an addendum will be issued to incorporate the approved material or equipment into the contract documents.
- C. Requests for substitutions must be received by the Engineer in ample time, not later than ten days before the bid due date, so that any necessary addendum will be received by all prospective bidders before submission of the bids.
- D. After award of the contract, requests for substitutions will be considered only for one of the following reasons:
 - 1. Increased value to the Owner
 - 2. Decreased cost to the Owner
 - 3. Specified items not procurable
- E. Requests for substitutions after award of the contract shall be accompanied by manufacturer's data or other detailed descriptions of the proposed material or equipment.
- F. A request for a substitution constitutes a representation that the Contractor has investigated and determined the proposed product is equal to or superior in all respects to that specified.

- G. The Contractor shall coordinate the installation of an accepted substitution into the project to provide a complete and operable system. Modifications or re-work of other parts of the project resulting because of substitutes will be at the Contractor's expense.
- H. The Engineer shall be the judge of the acceptability of the proposed substitutions.

1.03 Manufacturer's Instructions

- A. When contract documents require that installation of work shall comply with the manufacturer's printed instructions, the Contractor shall obtain and distribute copies of such instructions to the parties involved in the installation, including two sets to the Engineer. The instructions shall be provided in advance of installation. The Contractor shall notify the Engineer in the event job conditions or the requirements of the plans or specifications conflict with the manufacturer's instructions.
- B. The Contractor shall handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformity with the specified requirements.
- C. The Contractor shall perform work in accordance with manufacturer's instructions. No preparatory step or installation procedures shall be omitted unless specifically modified or exempted by contract documents.

PART 2 - PRODUCTS

2.01 Purchase Delivery and Installation

- A. The following will be purchased and installed by the Contractor per plans, details, and manufacturer recommendations. Submit color samples and shop drawings for approval by Engineer prior to fabrication:
 - 1. Shower Tower, by Most Dependable Fountain, stainless steel, model 565 SM ADA with hose bib, or approved equal. (910) 867-0039.
 - 2. Catch Basin, is a polyethylene yard drain with riser, by NDS, 9-inch, part 931 with square grate tamper resistant, or approved equal.
 - 3. Ornamental Fence, Black aluminum, 4-foot height, Eschelon II model, classic picket, 2-rail with 3-inch square posts, as manufactured by Ameristar (888-333-3422), or approved equal. Includes a concrete mow strip per details.
 - 4. Splash Pad Signs will be aluminum, purchased and installed by the site contract as noted in the plans.
 - 5. Backflow Preventor Enclosure, will be an expanded metal cage to secure the backflow preventor, as manufactured by Guardian Enclosures (877) 490-7700 or equal, installed on a 4-inch concrete pad.

PART 3 - EXECUTION

3.01 Transportation and Handling

A. The Contractor shall arrange deliveries of products in accordance with construction schedules and coordinate them to avoid conflict with work and conditions at the site.

- 1. Products shall be delivered in undamaged condition, in the manufacturer's original containers or packaging with identifying labels intact and legible.
- 2. Immediately upon delivery, the Contractor shall inspect shipments to assure compliance with requirements of contract documents and approved submittals and that products are properly protected and undamaged.
- B. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

3.02 Storage and Protection

- A. Products shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible.
 - 1. Products subject to damage by the elements shall be stored in weather tight enclosures.
 - 2. Temperature and humidity shall be maintained within the ranges required by manufacturer's instructions.
- B. The Contractor shall arrange storage in a manner to provide easy access for inspection and make periodic inspections to assure that products are maintained under specified conditions and free from damage or deterioration.
- C. For products specified by naming one or more products or manufacturers and "or equal", the Contractor must submit a request for substitutions for any product or manufacturer not specifically named.

3.03 Installation

- A. The Contractor shall install the following items as purchased by others. Storage will be coordinated by the Contactor; freight and delivery will be paid by others.
 - Splash Pad shall be a complete recirculating system including powder coated steel multistation interactive features with interchangeable/removable above grade elements represented in the detailed plans as manufactured by Aquatics (810-229-6245). All pressurized lines to be schedule 80 pvc, drain lines can be schedule 40 pvc. A premanufactured punched metal Mech 2.0 control and tank unit will be provided by Aquatics for installation by the Contractor including booster pump, rain diverter, and custom advertising panels.
 - 2. Storage Building shall be a materials storage structure matching the Mech2.0 unit. This will be installed on a 4-inch concrete slab.
 - 3. Play Structure and Swings: The pre-manufactured units by Landscape Structures will be installed with concrete footings.
 - 4. Safety Surface: Forever Lawn artificial turf will be installed by the Contractor; coordination with material provider who will provide the stone base preparation; final grading will be required by the site Contractor.
 - 5. Site Furnishings, as indicated on the plans, will be installed by the site Contractor using epoxy anchor bolts on concrete surface or direct bury as indicated.

6. Shade Sails will be installed on concrete footings per plans and details, by the site Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The following items will be paid for at the contract unit price for the actual quantity of the following pay item(s) provided and installed.

<u>Pay Item</u>	<u>Pay Unit</u>
Shower Tower and Catch Basin	Each
Ornamental Fence, 4'	Foot
Chain Link Fence, Vinyl Coated, 4'	Foot
Splash Pad Sign	Lump Sum
Backflow Preventor, Enclosure, and Concrete Pad	Lump Sum
Install Splash Pad	Lump Sum
Install Storage Building	Lump Sum
Install Play Equipment	Lump Sum
Prepare Base for Safety Surface	Lump Sum
Prepare Base for Site Furnishings	Lump Sum
Install Shade Sails	Lump Sum

The pay item(s) include installation of the item (as noted) and installation, appurtenant items, as well as temporary storage if necessary.

4.02 Measurement

Items will be measured by the pay limits as shown on the plans.

END OF SECTION

SECTION 01 32 14 SCHEDULE REQUIREMENTS

PART 1 - GENERAL

1.01 Work Included

The Contractor shall develop a detailed schedule, identifying various phases or divisions of work, indicating a start date and duration required for each. The schedule shall be presented to the Engineer or Owner in sufficient detail, as may be required by the Engineer or Owner, for their approval.

Periodically through the life of the project and as required by the Engineer or Owner, the Contractor shall update the schedule and provide copies to the Engineer and Owner.

1.02 Requirements

The Contractor shall schedule work to be performed during normal business hours, unless otherwise directed on the plans or approved by the Engineer.

Once work has begun on the project, the Contractor shall work continuously and expeditiously to complete all work provided for by the contract.

Project shall be substantially completed in accordance with the date specified in the agreement. Substantial completion is the stage of completion where the project is fit for occupancy and use without hindrance for its intended purpose.

Project shall be fully completed and ready for final payment in accordance with the date specified in the agreement.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

SECTION 01 33 00 SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 Work Included

- A. This section includes procedures for preparing and transmitting submittals required by specification sections for a product, material, or construction method. Submittals shall include the following:
 - 1. Shop drawings
 - 2. Product data
 - 3. Manufacturer's certificates
 - 4. Design data and calculations
 - 5. Manufacturer's instructions
 - 6. Manufacturer's field service reports
 - 7. Samples
 - 8. Operation and maintenance manuals (timing, quantity, content, and form)
- B. It is the responsibility of the General Contractor to convey the requirements of this section to their sub-contractors and their suppliers and vendors.

1.02 Submittals

A. Schedule submittals to expedite work. Unless otherwise indicated in this section, submittals shall be submitted within 30 days of date of Notice to Proceed.

B. Preparation

- 1. Provide separate submittals for each specification section requiring submittals. Where multiple sections relate to the same system or element and are being provided from the same source, a single combined submittal is acceptable.
- 2. Coordinate submission of related items. Group submittals of related products in a single transmission.
- 3. Include all submittal material requested for that section.
- 4. Identify variations from requirements of contract documents. State product and system limitations which may adversely affect work.
- 5. Mark or show dimensions and values in same units as specified.

C. Contractor Responsibilities

1. Review submittals prior to transmittal. Verify compatibility with field conditions and dimensions, product selections and designations, quantities, and conformance of

submittal with requirements of contract documents. Return non-conforming submittals to preparer for revision, rather than submitting for review.

2. Coordinate submittals to avoid conflicts between various items of work.

3. Submittal Transmittal Form

- a. Include with each submittal a transmittal form. A sample copy of an acceptable form is included in Attachment A. The Contractor's standard submittal form may be used, provided it contains essentially the same information as the sample.
- b. Identify project, Contractor, subcontractor, supplier, manufacturer, pertinent drawing sheet and detail numbers, and associated specification section numbers.
- c. Sequentially number transmittal forms. Re-submittals shall have original number with a suffix. Acceptable form of number is SS SS-NN-T where:
 - i. SS SS SS indicates specification section number;
 - ii. NN indicates different submittals for that specification section; and
 - iii. T indicates the number of times that submittal has been made.
- 4. Failure of the Contractor to review submittals, prior to transmittal for review, shall be cause for rejection.
- 5. Incomplete, improperly packaged, and submittals from sources other than the Contractor will not be accepted.

D. Transmittal

Where possible, transmit all submittals electronically. Where electronic submittal is not possible, submit four paper copies for the Engineer's retention, plus as many copies as the Contractor desires returned after review. Samples shall be submitted as described elsewhere in this specification.

E. Review

The Engineer will review and return submittals with comments.

- F. Do not fabricate products or begin work which requires submittals until return of reviewed submittal with A/E or SNL SE acceptance.
- G. On return, promptly distribute reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

H. Resubmission

- 1. Revise and resubmit submittals, as required, within 15 days of return from initial review.
- 2. Make re-submittals under procedures specified for initial submittals.
- 3. Identify all changes made since previous submittal.

1.03 Quality Assurance and Quality Control

A. Where required by specification sections, provide quality assurance submittals:

1. Qualification Data

Contractor shall submit written information demonstrating capabilities and experience of firm or person. Include lists of complete projects with names and contact information for references.

2. Manufacturer's Certificates

Submit reference data, affidavits, and certifications on manufacturer's letterhead certifying that products conform to or exceed specified requirements. Certificates may be based on recent or previous test results supplied by manufacturer and accepted by the Engineer.

3. Installer Approval

Certification on manufacturer's letterhead that installer complies with requirements and is approved for installing manufacturer's products.

4. Welding Certificates

Written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specifications (WPS) and Procedure Qualification Record (PQR) on American Welding Society (AWS) forms. Include names of firms and personnel certified.

Field Test Reports

Written reports from qualified testing agency indicating and interpreting results of field tests performed either during or after installation for compliance with specified requirements.

1.04 Submittal Review

A. The Engineer will review submittals for the sole purpose of verifying general conformance with design intent and general compliance with contract documents. Approval of submittal by the Engineer does not relieve the Contractor of responsibility for correcting errors which may exist in submittal, or from meeting requirements of contract documents.

B. Review Time

Initial review will be performed within 14 days of receipt. Reviewer reserves the right to withhold action on a submittal requiring review of related submittals, until related submittal is received. Additional time will be required if processing must be delayed to permit review of related subsequent submittals. The Engineer will review re-submittals within 14 days.

C. Review Actions

After review, submittals will be returned and marked as follows to indicate action taken:

1. Reviewed, No Comments

Part of work covered by submittal may proceed, provided it complies with requirements of contract documents. Final acceptance will depend upon that compliance.

2. Reviewed, With Comments

Part of work covered by submittal may proceed, provided it complies with notations and corrections on submittal and requirements of contract documents. Final acceptance will depend upon that compliance.

3. Revise and Resubmit

Do not proceed with part of work covered by submittal including purchasing, fabricating, and delivering. Revise or prepare new submittal in accordance with notations and resubmit.

1.05 Drawings

- A. Where required by specifications or otherwise needed, prepare drawings illustrating portion of work for use in fabricating, interfacing with other work, and installing products. Contract drawings shall not be reproduced and submitted as shop drawings.
- B. When construction is complete, prepare and submit red-lined copies of the contract drawings showing clearly how construction deviated from the design, along with the authority for the deviation or change.

C. Electronic Format

- 1. Size printable to: 8½ inches by 11 inches minimum and 24 inches by 36 inches maximum.
- 2. Present in a clear and thorough manner. Title each drawing with project name. Identify each element of drawing with reference number.
- 3. Plans, elevations, sections, and detail shop drawings shall be to scale, with scale indicated.
- 4. Indicate field verified dimensions. Show relationship of products to adjacent work. Note coordination requirements.
- 5. Schematics and diagrams shall be logically arranged and presented in a clear, understandable manner with all items labeled.
- 6. Internal wiring diagrams: Provide internal wiring and elementary ladder diagrams for factory pre-wired equipment.
- 7. Control diagrams: Show relative positions of each component as a system diagram.

1.06 Product Data

A. Provide product data such as manufacturer's brochures, catalog pages, illustrations, diagrams, tables, performance charts, and other material which describe appearance, size, attributes, code and standard compliance, ratings, and other product characteristics.

B. Form

- 1. Provide all critical information such as reference standards, performance characteristics, capacities, power requirements, wiring and piping diagrams, controls, component parts, finishes, dimensions, and required clearances.
- 2. Submit only data which are pertinent. Mark each copy of manufacturer's standard printed data to identify products, models, options, and other data pertinent to project.

- 3. Modify manufacturer's standard schematic drawings and diagrams and supplement standard data to provide specific information applicable to project. Delete information not applicable.
- 4. Colors and Patterns: Unless color and pattern is specified for product, submit accurate color and pattern charts or samples illustrating manufacturer's full range for selection by the Engineer. Submit two hard copies only.

1.07 Design Data and Calculations

- A. Where required by specification sections, provide basic calculations, analyses, and data to support design decisions and demonstrate compliance with specified requirements. State assumptions and define parameters. Give general formulas and references. Provide sketches, as required, to illustrate design method and application.
- B. Arrange calculations and data in a logical manner, with suitable text to explain procedures and order.
- C. Indicate name, title, and telephone number of individual performing design and include professional seal of designer where applicable or required.

1.08 Manufacturer's Instructions

- A. Where required by specification sections, provide manufacturer's instructions for activities such as delivery, storage, assembly, installation, wiring, start-up, adjusting, and finishing.
- B. Indicate pertinent portions and identify conflicts between manufacturer's instructions and contract documents.
- C. Where appropriate, include preparation procedures; service connection requirements; critical ambient conditions; foundation requirements; special precautions; adjustment requirements; alignment procedures; leveling; purging; charging; lubrication; and cleaning prior to operation and/or Owner's acceptance.
- D. Installation (e.g., assembly, mounting, or wiring) and start-up instructions shall be submitted and available for review in the field prior to scheduled material or equipment installation.

1.09 Samples

A. Submit samples to illustrate functional and aesthetic characteristics of products with all integral parts and attachment devices. Include full range of manufacturer's standard finishes, indicating colors, textures, and patterns for Engineer selection.

B. Submission

Submit the number of samples specified in individual specification sections. One sample will be retained by the Engineer.

C. Label with identification related to submittal transmittal form.

1.10 Manufacturer's Field Service Reports

A. When an individual specification section requires services of manufacturer's field representative, submit report of observations, site decisions, and instructions given to installers.

B. Form

- 1. Present complete information in clear concise manner.
- 2. Bind with titled cover in folder or binder.

C. Report shall include:

- 1. Time, location, conditions, and duration of activity;
- 2. Names of persons performing and witnessing activity;
- 3. Equipment used;
- 4. Description of activity, data recorded, and results;
- 5. Deficiencies found, corrective measures, and results of retesting; and
- 6. Other pertinent data.
- D. Submit report within 30 days of construction site service visit.

1.11 Operation and Maintenance Data

A. Where required by specification sections, provide operation and maintenance manuals.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

Not Applicable

END OF SECTION

ATTACHMENT A - SAMPLE SUBMITTAL TRANSMITTAL FORM

Attachment A

SAMPLE SUBMITTAL TRANSMITTAL FORM

PROJECT:

CONTRACT NUMB	ER:		
SUBMITTAL NUMI	BER:	RESUBMITTAL: YES N	10
DATE: NUMBER OF COPIES SUBMITTED:			
SUBMITTAL DESCR	RIPTION:		
RELATED DESIGN	 DISCIPLINE (circle):		
Civil	Landscape	Architectural	Structural
Mechanical	Electrical	Telecommunications	Security
Fire Protection	Controls	Other:	
ASSOCIATED SPEC	IFICATION SECTION NO:		
REFERENCED DRA	WING SHEET NO:		
		PROVIDING SUBMITTAL DATA:	
Address:			
Telephone Nu	mber:		
CONTRACTOR:			
Address:			
Telephone Nu	mber:		
CONTRACTOR'S C	ERTIFICATION:		
The undersigned, certifies that:	as representative of the Con	tractor for the above project, su	bmits the following and
1. Submittal has except as note	·	ete and conforms to requirements	s of contract documents,
•	ensions have been field verifie ion of proposed work.	d and are acceptable for installation	on of proposed products
3. Required qua correct.	ntities for products and ma	terials covered by this submitta	I have been verified as
-	ocesses and construction me ill result in a complete, function	thods proposed in this submittal onal installation.	I are acceptable for this
	Submittal has been coordinated with other submittals and work and proposed products an construction will properly interface with other construction.		
NAME OF CONTRA	ACTOR REVIEWER:		
SIGNATURE OF CO			

SECTION 01 41 26 PERMIT REQUIREMENTS

PART 1 - GENERAL

1.01 Work Included

The Contractor shall complete work in accordance with all applicable regulations, laws, and ordinances. Work shall be completed in accordance with permits issued by regulatory agencies.

The Contractor shall obtain permits, including the paying of fees, posting bonds, and providing insurance coverage, to secure permits which have not been obtained by the Owner.

Where permits have been obtained by the Owner, the Contractor shall conduct work and operations consistent with the requirements of the permits.

Where changed conditions or other issues arise such that the conditions of a permit which has been issued cannot be met, the Contractor shall promptly notify the Owner and the permitting agency. The Contractor shall provide such additional information as may be necessary to secure a modification to the original permit to allow the planned work to continue.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Permits to be Obtained by Contractor

A. Permit Applications Completed by the Owner

The Owner has submitted information and reviewed the proposed work with the following agencies. Final permits have not yet been issued. The Contractor is required to obtain the permits for the proposed project including the paying of fees, posting bonds, and providing insurance coverage to secure permits.

Permit Agency	Permit Type	Requirements	
State of Michigan Department			
of Environment, Great Lakes,		Execute permit and pay	
and Energy	Pool Construction Permit	associated inspection fees	
Washtenaw County Drain		Execute permit and pay	
Commission	Storm water discharge	associated inspection fees	
Washtenaw County Drain	Soil Erosion and Sediment	Execute permit and pay	
Commission	Control	associated inspection fees	

B. Other Permits to be Obtained by the Contractor

The Contractor is responsible to obtain all permits necessary to complete the proposed work, which have not been obtained by the Owner.

PART 4 - MEASUREMENT AND PAYMENT

Obtaining permits, including the paying of fees, posting bonds, and providing insurance coverage to secure permits, is considered included in other items of work and will not be paid for separately.

SECTION 01 45 16.01 CONCRETE TESTING

PART 1 - GENERAL

1.01 Work Included

This work includes requirements for concrete, concrete submittals, and testing.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ACI PRC-211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
- B. ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
- C. ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- D. ASTM C138 Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- E. ASTM C143 Standard Test Method for Slump of Hydraulic-Cement Concrete
- F. ASTM C172 Standard Practice for Sampling Freshly Mixed Concrete
- G. ASTM C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- H. ASTM C595 Standard Specification for Blended Hydraulic Cements
- I. ASTM C1064 Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- J. ASTM C1260 Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
- K. ASTM C1293 Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
- L. ASTM C1567 Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
- M. ASTM E29 Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- N. Michigan Department of Transportation 2020 Standard Specifications for Construction
- O. Michigan Test Methods (MTM)
- P. Michigan Department of Transportation Qualified Products List

1.03 Related Work

A. Section 32 13 00 - Concrete Curb and Gutter, Sidewalk, and Miscellaneous Pavement

1.04 Submittals

- A. Prior to beginning construction, the Contractor shall submit the name and plant location of the proposed NRMCA certified concrete supplier for the project.
- B. Prior to beginning construction, the Contractor shall submit mix designs for the proposed concrete mixtures proposed for use on the project for the Engineer to review.
- C. The Contractor shall submit a Quality Control Testing plan to be approved by the Engineer.

1.05 Quality Assurance and Quality Control

A. The Contractor will be responsible for Quality Control Testing and the Owner will be responsible for Quality Assurance Testing.

B. Concrete Testing

- 1. The temperature of concrete will be determined in accordance with ASTM C1064.
- 2. Samples of concrete for testing will be obtained in accordance with ASTM C172.
- 3. The slump of concrete will be determined in accordance with ASTM C143.
- 4. The air content of concrete will be measured in accordance with ASTM C231.
- 5. Concrete cylinders for compressive testing will be made in accordance with ASTM C31. The Engineer and Contractor shall use the same size cylinder for test specimens. Four-inch cylinders are preferred, as allowed by ASTM C31.
- 6. The compressive strength of concrete will be determined in accordance with ASTM C39.

PART 2 - PRODUCTS

2.01 Mix Design and Documentation

Design concrete mixtures shall meet the requirements specified in Table 1. The Contractor shall provide the grade of concrete for the section number reference application specified in Table 1, or as specified in the contract. The Contractor shall submit a request variance, in writing, when proposing a mix design that exhibits temperature, slump, or air content other than those specified. This submittal shall include the proposed mix design, Job Mix Formula (JMF), and associated trial batch verification test data. Do not use a grade of concrete with a lower specification limit (LSL) 28-day compressive strength less than what is designated for the application.

Blended cement meeting the requirements of ASTM C595 Type IL is permitted.

Secure prior approval from the Engineer to use concrete intended for early opening to traffic to facilitate driveway gaps or other features necessary for required local access.

Unless otherwise specified in the contract, set accelerating admixtures are prohibited.

Unless otherwise specified in the contract, do not exceed 40 percent replacement of the Portland cement in the concrete mixture with slag cement (Grade 100 minimum) or fly ash. Do not exceed 40 percent total replacement of the Portland cement if both slag cement and fly ash are used in the concrete mixture.

Use the combined weight of all cementitious materials to determine compliance with the maximum water-cementitious ratio and cementitious material content requirements specified in Table 1.

Table 1: Minimum Mix Design Requirements for Concrete					
			Concrete Grade		
		3,000	3,500	4,000	4,500
Compressive strength (psi)	7-day	2,200	2,600	3,000	3,200
	28-day	3,000	3,500	4,000	4,500
	70%	2,100	2,450	2,800	3,150
Flexural Strength (psi)	7-day	500	550	600	625
	28-day	600	650	700	750
	70%	420	455	490	525
Slump (inch)		(c)-(f)	(c)-(k)	(l)-(n)	(d)-(f)
Cementitious material content (lb/cyd)		489-517	517-611 (o)	517-611	517-658
Class of coarse aggregate		(p)-(r)			
Maximum w/cm ratio		0.45			
Air content range		5.5-8.5%			

- a. Reserved for future use.
- b. Reserved for future use.
- c. 0- to 3-inch slump for mixtures for pavements.
- d. 0- to 3-inch slump without admixtures or with Type A or D admixture.
- e. 0- to 6-inch slump after the addition of Type MR admixture.
- f. 0- to 7-inch slump after the addition of Type F or G admixture.
- g. 3- to 7-inch slump for tremie applications without admixture or with Type A or D admixture.
- h. 3- to 7-inch slump for tremie applications after the addition of Type MR admixture.
- i. 3- to 8-inch slump for tremie applications after the addition of Type F or G admixture.
- j. 6- to 8-inch slump for dry placed drilled shafts.
- k. 7- to 9-inch slump for wet placed drilled shafts.
- I. 3- to 5-inch slump without admixtures or with Type A or D admixture.
- m. 3- to 6-inch slump after the addition of Type MR admixture.
- n. 3- to 7-inch slump after the addition of Type F or G admixture.
- o. For concrete pavement repair mixtures, use 658 lb/cyd of cement when the weather is forecast to be above 50 degrees Fahrenheit or 752 lb/cyd when the weather is forecast to be 50 degrees Fahrenheit or below.
- p. Use aggregates only from geologically natural sources for pavement, shoulder, miscellaneous pavement (including ramps), concrete pavement overlay, bridge approach slab, structural concrete, drilled shaft, bridge railing, and bridge sidewalk applications.

- q. Unless otherwise required, use Coarse Aggregate 6AA or 17A for exposed structural concrete in bridges, retaining walls, and pump stations.
- r. The flexural and compressive strengths are not part of the specifications but are listed for informational purposes only and are the minimum strengths anticipated for the mix proportions specified for the various grades of concrete when cured under standard conditions.

A. Alkali-Silica Reactivity

Provide documentation to the Engineer that the concrete mixture does not present the potential for excessive expansion caused by alkali-silica reactivity (ASR). Provide current ASR test results (valid for two years from completion of testing), for the fine aggregate that is proposed to be used in the concrete from an independent testing laboratory proficient in ASR testing. The independent testing laboratory must certify, in writing, that all testing was conducted in accordance with the designated standard test procedures described herein. Test results must conform to the specified criterion for one of the following standard test methods. Use the Rounding Method described in ASTM E29 when determining significant digits for reporting expansion test results.

1. Method 1 – ASTM C1260 Mortar Bar Test

If the expansion of the mortar bars is less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the fine aggregate is considered non-deleterious to ASR and may be used in the concrete without the need for ASR mitigation.

2. Method 2 – ASTM C1293 Concrete Prism Test

- a. If the expansion of concrete prisms is not greater than 0.040 percent (rounded to the nearest 0.001 percent) after 1 year, the fine aggregate is considered non-deleterious to ASR and may be used in the concrete without the need for ASR mitigation.
- b. If the expansion of concrete prisms is greater than 0.040 percent, but not exceeding 0.120 percent (rounded to the nearest 0.001 percent) after 1 year, the fine aggregate is considered moderately deleterious to ASR and mitigation is required, as follows. A low-alkali cement with Na₂O equivalent alkalies (Na₂O + 0.658 × percent K₂O) not exceeding 0.60 percent must be used in the concrete mixture to mitigate the potential for ASR. Slag cement or fly ash may be used in conjunction with the low-alkali cement. The total alkali content for the cementitious materials combination must not exceed 3 pounds per cubic yard of Na₂O equivalent.

3. Method 3 – ASTM C1567 Accelerated Mortar Bar Test

If no previous test data are available for the fine aggregate that shows it is resistant to ASR using either Method 1 or 2 above, replace 25 percent to 40 percent of the Portland cement in the concrete mixture with slag cement (Grade 100 minimum) or fly ash. A blended cement meeting the requirements of ASTM C595 containing Portland cement and slag cement or fly ash may also be used.

Demonstrate the ability of the fly ash or slag cement to control the deleterious expansion caused by ASR by molding and testing mortar bars according to the standard test method described in ASTM C1567, using the mix proportions and constituent sources for both the aggregates and the cementitious materials that will be used for the project. Make at least three test specimens for each cementitious materials-aggregate combination. If the

average of 3 mortar bars for a given cementitious materials-aggregate combination produces an expansion less than 0.10 percent (rounded to the nearest 0.01 percent) at 14 days of immersion, the JMF associated with that combination will be considered non-deleterious to ASR. If the average expansion is 0.10 percent (rounded to the nearest 0.01 percent) or greater, the JMF associated with that combination will be considered not sufficient to control the deleterious expansion caused by ASR and the JMF will be rejected.

The Engineer will not approve the use of the JMF if the expansion exceeds the respective threshold limits for the respective ASTM test method used.

B. Mix Documentation

Provide mix design and accompanying JMFs using the methods of verification included in this specification. Include sufficient information on constituent materials and admixtures, along with trial batch verified physical properties of the fresh concrete, mix proportions per cubic yard for all constituents, and compressive strength test results necessary to allow the Engineer to fully evaluate the expected performance of the concrete mixture.

Submit mix design and JMF; include accompanying documentation. List the source of materials, bulk density (unit weight) of coarse aggregate (rodding procedure or shoveling procedure), absorption of aggregates, relative density (specific gravity) of aggregates, aggregate correction factors, batch weights, and project specific or historical laboratory test data. Include the recorded air content of fresh concrete using the same admixture and cementitious material sources to be used in the production of the concrete for the project. A JMF will be approved only if all of the minimum mix design requirements specified in the contract have been met. Use of the MDOT Job Mix Formula Concrete Field Communication Form (MDOT Form Number 1976) is encouraged.

1. Job Mix Formula

Select proportions for concrete mixtures according to ACI Standard 211.1. The volume (oven-dry-rodded) of coarse aggregate per unit volume of concrete must be 65 percent, minimum.

Four methods of verification of proposed JMF are acceptable.

a. Method 1 – Trial Batches

Verification of JMF is based on trial batches with the same materials and proportions proposed for use on the project. Prepare at least one trial batch for each mix design in sufficient time before starting concrete placement to allow for review, according to subsection 2.01.A of this specification. Provide the results of temperature, slump, density (unit weight), air content of fresh concrete, 28-day compressive strength, and age of concrete at the time of strength testing, for a minimum of 3 independent samples. All samples may be taken from a single trial batch for a mix design, provided the trial batch is at least 4 cubic yards in volume. For JMF trial batch verification purposes only, 7-day compressive strength test results which report at least 70 percent of the specified 28-day lower specification limit will be sufficient documentation, in lieu of 28-day compressive strengths. The average of at least two strength test specimens represents one compressive strength sample test result for

each independent sample. Provide the necessary ASR documentation as described in subsection 2.01.A of this specification.

b. Method 2 – Same Mix

Verification of JMF is based on experience with the same mix design, JMF, and the same materials. Provide the results of temperature, slump, density (unit weight), air content of fresh concrete, 28-day compressive strength, and age of concrete at the time of strength testing, for a minimum of 3 independent samples produced within the previous 12 months. The average of at least two strength test specimens represents one compressive strength sample test result for each independent sample. Do not substitute material types or sources, including admixtures or cementitious materials, nor change mix proportions in the JMF. Provide the necessary ASR documentation as described in subsection 2.01.A of this specification.

c. Method 3 – Similar Mix

Verification of JMF is based on requirements described in Method 2 above. Substitution of coarse aggregate source is permitted if the new source is of the same geologic type as the original aggregate, and conforms to the specification requirements for the application. Substitution of fine aggregate is permitted only if the new source has been tested for ASR. Provide the necessary ASR documentation as described in subsection 2.01.A of this specification.

Provide the supporting laboratory trial batch documentation and accompanying calculations showing how the mix proportions in the JMF were adjusted, based on the documented differences in relative density (specific gravity), bulk density (unit weight), and absorption of the substituted aggregate sources, to produce a theoretical yield of 100 percent and the required fresh concrete properties.

d. Method 4 – Annual Verification

At the Engineer's option, verification may be accepted annually for a concrete plant rather than on a project basis provided the sources and proportions of the constituent materials, including cementitious materials and source and types admixtures, do not change. If the project is the continuation of work in progress during the previous construction season and written certification is submitted to the Engineer that materials from the same source and with the same mixture properties are to be used, the Engineer may waive the requirement for annual renewal verification of the JMF for the project. Provide the necessary ASR documentation as described in subsection 2.01.A of this specification.

C. Concrete Testing and Break Results

The Contractor shall submit a sample form that will be used to document concrete testing and break results, prior to start of construction, to be approved by the Engineer. The Contractor shall submit the approved form documenting results within three days of concrete testing.

PART 3 - EXECUTION

3.01 Sampling and Testing

The Engineer shall verify the Contractor's daily startup sampling and testing of temperature, slump, and air content of fresh concrete on the first load; conduct QA sampling and testing; monitor Contractor adherence to the QC plan; and inspect field placed materials in such a manner as to ensure that all concrete for the project is represented at a rate determined by the Engineer/Owner.

- A. The following ASTM test methods will apply.
 - 1. C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
 - 2. C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - 3. C138 Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
 - 4. C143 Standard Test Method for Slump of Hydraulic-Cement Concrete
 - 5. C172 Standard Practice for Sampling Freshly Mixed Concrete
 - C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

B. Sampling

Sampling and testing shall be conducted by the Contractor during placement of the concrete. The Contractor shall take a random sample at a rate of approximately once per 50 cubic yards, based on the anticipated total quantity of concrete to be placed and site conditions, with a minimum of 1 sampling for each day of production per mix design. The sampling rate may be increased by the Engineer if project conditions warrant increased testing. A minimum of 3 cylinders shall be taken for each test (one 7-day break and two 28-day breaks).

The Contractor may elect to provide early concrete cylinder breaks. The Contractor is responsible for all additional costs and materials for providing early concrete cylinder breaks. Results for early cylinder breaks shall be submitted to and approved by the Engineer prior to beginning next related work item.

The Engineer shall perform Quality Assurance testing, on an as-needed basis, at a rate determined by the Engineer/Owner.

Samples will be taken from the concrete at the location as close to its final placement into the forms or on the grade as practical. If sampling from the discharge of the haul unit, the sample will be taken from approximately the middle $^{1}/_{3}$ of the load.

Samples for acceptance will not be taken at the concrete production facility (batch plant), nor prior to discharge from a concrete pump (excluding tremie seal placement applications).

C. Small Incidental Quantities

1. Reduced Quality Control (QC) for Small Incidental Quantities.

Reduced levels of on-site QC testing for concrete may be considered for small incidental quantities. Unless approved by the Engineer, multiple small incidental quantities, including ones that are placed consecutively throughout the project on the same day, are not eligible for reduced QC consideration if the total plan quantity of concrete for the item exceeds 100 cubic yards. Include details for reduced QC testing and oversight in the approved QC plan in accordance with following:

- a. The small incidental quantity of concrete will be limited to a single day's concrete placement of a maximum 20 cubic yards;
- b. The small incidental quantity of concrete is not an integral part of a structural loadbearing element;
- The Engineer has received written certification from the Contractor that the concrete supplier has a current QC plan in place and available for review upon request by the Engineer;
- d. The concrete supplier employs an MCA-certified Michigan Concrete Technician Level II available at the plant or on call during concrete placement to validate and authorize modifications to the concrete JMF;
- e. The Engineer verifies that the temperature, slump, and air content conform to specification requirements at the start of the day's concreting operation associated with the small incidental quantity; and
- f. The Engineer is notified a minimum of 24 hours prior to concrete placement.
- 2. Reduced Quality Assurance (QA) for Small Incidental Quantities.

At the discretion of the Engineer, daily 28-day compressive strength QA test cylinders for small incidental quantities of concrete may not be required provided QA test cylinders representing the same JMF were sampled and molded at least once during the same week.

3.02 Suspension Limits

If during the pour the concrete is found to be out of the specifications in Table 2, then the pour shall be stopped until concrete can be provided that meets the project specifications. The Engineer will not pay for items placed with concrete that does not meet the following specifications.

Table 2			
Quality Characteristic			Suspension Limits
Air Content (percent)			<5.0 or >9.0
Air Content Loss (percent)			Greater than 1.5
Concrete	Temperature	(degrees	<45 or >90 at time of placement
Fahrenheit)			
Slump			See Table 1

3.03 Acceptance

Concrete items will be accepted based on the criteria in the items specification; concrete was placed within the limits of Table 2 and the average of the corresponding 28-day test cylinders being above the design strength.

PART 4 - MEASUREMENT AND PAYMENT

The work of onsite concrete testing and submitting concrete mix designs and accompanying documentation is considered included in other items of work and will not be paid for separately.

SECTION 01 45 16.02 DENSITY AND AGGREGATE TESTING

PART 1 - GENERAL

1.01 Work Included

This work includes material testing of soil, aggregates, stabilized mixtures, and pulverized pavement mixtures.

1.02 References

- A. Michigan Department of Transportation 2020 Standard Specifications for Construction
- B. Michigan Department of Transportation Density Testing and Inspection Manual
- C. Michigan Department of Transportation Procedures for Aggregate Inspection
- D. Michigan Test Methods (MTM)

1.03 Related Work

- A. Section 31 23 01 Excavating, Filling, and Grading
- B. Section 32 11 23 Aggregate Base
- C. Section 32 13 00 Concrete Curb and Gutter, Sidewalk, and Miscellaneous Pavement
- D. Section 33 05 00 Adjusting Structures
- E. Section 33 11 00 Water Main
- F. Section 33 31 00 Sanitary Sewer
- G. Section 33 42 00 Culverts
- H. Section 33 44 00 Storm Sewers
- I. Section 33 46 16 Underdrains

1.04 Quality Assurance and Quality Control

- A. Soil and Aggregate Density Testing
 - 1. The Contractor is responsible for all quality control density testing on this project. The Engineer will complete quality assurance density testing at a random rate.
- B. Sand and Aggregate Gradation

The Contractor is to supply sand and aggregates in the Michigan Department of Transportation gradations, as specified by the project specifications.

Contractors are encouraged to use "prequalified" Michigan Department of Transportation aggregate sources. If the Contractor elects to use a non-prequalified source, then the Contractor shall be responsible for supplying the Engineer with Sieve Analysis (MTM109) and Loss by Washing (MTM108) at the following rates:

Coarse Aggregates1 per 1,000 tonsDense-Graded Aggregates1 per 1,000 tonsOpen-Graded Aggregates1 per 1,000 tonsGranular Material Class I1 per 1,000 tons

Granular Material Class II and IIA 1 per 3,000 cubic yards
Granular Material Class III 1 per 10,000 cubic yards

Fine Aggregate 1 per 1,000 tons

All Sieve Analysis and Loss by Washing reports shall be signed and sealed by a Professional Engineer.

1.05 Job Conditions

A. Access for Testing

The Contractor shall provide the Engineer safe access for testing technicians to complete any required testing. Reasonable time for testing shall be allowed by the Contractor.

B. Safety

The Contractor is responsible for conducting operations in a safe and orderly manner and in conformance with MIOSHA P.A. 154.

PART 2 - PRODUCTS

2.01 Submittals

The Contractor shall submit a Quality Control Testing plan to be approved by the Engineer. The Quality Control Testing plan shall include, at a minimum, the company performing the testing, certifications, equipment calibration reports, frequency of testing, procedure for notifying the Engineer if tests fail to meet specifications, corrective action plan, and sample form that will be used to document material testing results. The Contractor shall submit the approved form documenting results within three days of material testing.

PART 3 - EXECUTION

3.01 Minimum Percent of Compaction for Aggregates

The following are a minimum percent compaction for typical items of work. Note: Higher percent compaction may be required for specific items of work, see specifications for those items.

A. Original Ground

Road Embankment Areas	90 percent
Bridges – within the limits as shown on the plans	95 percent

B. Cut Areas

Cuts requiring Sand Subbase	95 percent
Cuts not requiring Sand Subbase	95 percent
Subgrade for HMA Base, Aggregate Base, and Concrete Widening	95 percent
Trenches for under HMA Shoulders	98 percent*

C. Embankments and Backfill

Regular	95 percent*
	(within top 3 feet)
Abutments with Piling	95 percent
Abutments without Piling	100 percent
Foundation Undercut Backfill	100 percent
Backfill for Bridges, Culverts, Utilities, Manholes, Catch Basins,	
Edge Drains, and Subgrade Undercuts	95 percent
Foundations and Miscellaneous Structures	95 percent

D. Pavement Structure

Subbase	95 percent*
Subbase for Slope Paving	90 percent
Aggregate Base under Concrete Pavement	95 percent*
Aggregate Base under HMA Pavement	98 percent*
Pulverized HMA Aggregate Base	98 percent
Recycled Concrete Aggregate Base – under Concrete Pavement	95 percent
Recycled Concrete Aggregate Base – under HMA Pavement	98 percent
Aggregate Base – Sleeper Slab and Bridge Approach	98 percent
Shoulders – Class I	98 percent*
Shoulders – Class II, III, and IV	95 percent*
OGDC – used under Concrete and HMA Pavement	95 percent*
OGDC – used under Concrete and HMA Pavement (recycled materia	l) 98 percent*
* May NOT exceed entimum moisture	

^{*} May NOT exceed optimum moisture

3.02 HMA Density

The density control target, "Theoretical Maximum Density" (TMD) for HMA shall be calculated using the Gmm from the Contractors approved HMA mix design. TMD = Gmm X 62.4.

HMA Base Course	92 percent to 98 percent
HMA Leveling Course	92 percent to 98 percent
HMA Top Course	92 percent to 98 percent

The HMA layer must meet the required density target before the succeeding lift or traffic is placed on the pavement.

3.03 Testing Frequency

Each layer must be tested and meet compaction requirements before the succeeding layer is placed. The Engineer will test at a rate that is warranted for field conditions and Contractor means and methods. The list of frequencies below are minimums.

Subgrade	1 test per 500 feet per width of 24 feet or less
Embankment	1 test per 1,000 cubic yards of material
	and every lift
Subbase	1 test per 500 feet per width of 24 feet or less
Backfill	1 test per 300 cubic yards of material

Aggregate Base Course 1 test per 500 feet per width of 24 feet or less
HMA Mixtures 1 test per 500 feet per width of 24 feet or less

Shoulders 1 test per 1,000 feet each side

Sleeper Slab

1 test per bridge approach per stage
Foundations and Miscellaneous Structures
1 test per 1-foot lift or per 300 cubic yards

Trenching 1 test per 1,000 feet each side

3.04 Compaction Efforts

The Contractor shall continue to make compaction efforts to obtain the minimum standards given within this specification upon notification of a failing test. A passing test is required at every location of a failing test prior to starting the next related item of work.

PART 4 - MEASUREMENT AND PAYMENT

The work of density and aggregate testing is included in the pay item(s) which are specifically listed on the proposal and will not be paid for separately.

SECTION 01 50 00 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 Work Included

This work includes providing temporary facilities and controls during the construction of the project.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Electricity

Electricity for use by the Contractor during the construction of the project shall be provided by the Owner The Contractor shall provide such temporary systems necessary to convey the electricity to the work area from the point of supply.

Temporary power supply systems shall comply with all applicable codes.

3.02 Lighting

The Contractor shall provide lighting for construction activities. The Contractor shall provide fixtures, switches, conductors, and other equipment for a complete system. The lighting system shall meet the requirements of all applicable codes.

Electricity for lighting will be paid for as described in Section 3.01.

3.03 Heat, Ventilation

The Contractor shall provide heat and ventilation, as required, to maintain specified conditions for construction operations and to protect materials, equipment, and finishes from damage due to temperature or humidity.

The Contractor shall provide ventilation of enclosed areas to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases.

The Contractor shall provide ventilation of enclosed areas, as necessary, to maintain safe working areas as required by applicable codes.

3.04 Water

The Owner will provide water for construction activities, at the location of existing water lines, faucets, and hydrants. The Contractor shall provide such piping extensions, as necessary, to deliver the water to the location(s) required for construction activities.

3.05 Barriers

The Contractor shall provide barriers to prevent entry to construction areas or hazardous areas.

3.06 Enclosures

The Contractor shall provide temporary weather tight enclosures of openings in exterior surfaces to provide acceptable working conditions, protection of materials from the elements, and to prevent entry of unauthorized persons.

3.07 Protection of Installed Work

The Contractor shall control vehicle and pedestrian traffic and/or provide temporary protective coverings, as required, to protect installed or uncompleted work from damage.

3.08 Water Control

The Contractor shall grade the site to drain. Excavations shall be kept free of water. The Contractor shall provide pumps as required.

Water shall not be run to detrimentally affect adjacent buildings or properties.

3.09 Cleaning

The Contractor shall maintain the construction area free of debris and waste material. Debris and waste material resulting from construction operations shall be properly disposed of by the Contractor.

The Contractor shall clean areas, as required, for proper execution of the project work.

3.10 Drinking Water

The Contractor shall furnish drinking water for their workers.

3.11 Sanitary Facilities

The Contractor shall provide sanitary facilities for their workers as required by laws and regulations. The Contractor shall service and clean the facilities as needed or as directed by the Engineer.

PART 4 - MEASUREMENT AND PAYMENT

The work of construction facilities and temporary controls is included in the pay item(s) which are specifically listed as pay items on the proposal and will not be paid for separately.

SECTION 01 55 26 MAINTAINING TRAFFIC

PART 1 - GENERAL

1.01 Work Included

The Contractor shall execute the work in a manner such that traffic is maintained and access is provided throughout the park unless specific operations limit public access; in that case prior approval with the Owner will be required.

1.02 References

- A. Michigan Department of Transportation 2020 Standard Specifications for Construction
- B. Michigan Manual on Uniform Traffic Control Devices

PART 2 - PRODUCTS

2.01 Signing

Signing and barricading shall be provided by the Contractor in accordance with the details on the plans, the Michigan Manual on Uniform Traffic Control Devices, the Michigan Department of Transportation Maintaining Traffic Typicals, and the requirements of the road agency. Barricades left in place after dark shall be lighted.

The Contractor shall submit a plan of the proposed traffic control to the Engineer for review.

PART 3 - EXECUTION

3.01 Maintain Access Throughout the Park

It shall be the Contractor's responsibility to notify residents or occupants of property along the project of temporary closures of driveways or roads, in writing, a minimum of 24 hours in advance of closure. Contractor shall submit draft notice to Engineer for review and approval two work days prior to issuing it. Sufficient advance warning shall be provided to allow notification of all affected parties. A copy of the written notification shall be provided to the Engineer.

The duration of any closure shall be limited to the minimum length of time necessary to complete the particular task requiring the closure. In no case shall a closure extend overnight, unless approved by the Engineer or Owner.

Upon completion of pipe installation or other work requiring a closure of a driveway, road, or sidewalk, the area shall be backfilled and regraded to meet adjacent grades. A temporary gravel surface shall be provided and maintained by the Contractor. The gravel shall meet the requirements of 23A series aggregate, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction. Recycled HMA may also be utilized after approval of material by the Engineer. The gravel shall be placed to a depth of at least 8 inches.

3.02 Protection of Hazardous Areas

Excavation and hazardous areas shall be protected by barricades or snow fence. Barricades left in place at night shall be lighted.

3.03 Corrective Action

If in the Engineer's or Owner's opinion inadequate protection or maintenance of traffic is provided, the Engineer or Owner will attempt to contact the Contractor and notify them of the deficiency. If the Contractor cannot be notified or fails to make prompt corrections, the Owner or Engineer may authorize that said deficiencies be corrected by others. The cost of making such corrections will be charged to the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

The work of maintaining traffic is included in the pay item(s) which are specifically listed on the proposal and will not be paid for separately.

SECTION 01 71 13 MOBILIZATION

PART 1 - GENERAL

1.01 Work Included

Mobilization consists of preparatory work and operations, including but not limited to the following:

- A. The movement of people, equipment, and materials to the project site;
- B. The establishment of the Contractor's facilities to work on the project (offices, storage yards, borrow and disposal sites, etc.);
- C. Expenses incurred prior to beginning work on specific contract pay items;
- D. Pre-construction costs (not bidding costs) which are direct costs to the project, rather than direct costs to specific pay items.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Mobilization

Following Notice of Award, the Contractor shall expeditiously prosecute such work necessary for execution of the contract.

Following Notice to Proceed, the Contractor shall commence such work necessary to prepare for the beginning work on the project.

PART 4 - MEASUREMENT AND PAYMENT

The work of Mobilization will be paid for at the contract unit price for the following pay item(s), which are specifically listed on the proposal.

Pay Item Pay Unit Mobilization Lump Sum

Unless otherwise provided, the contract amount for Mobilization shall not exceed 10 percent of the total project amount.

If the amount bid for Mobilization exceeds the maximum amount established, the Contractor's bid price for Mobilization will be adjusted to the maximum amount, and the total bid price and contract amount will be based upon the revised price. The failure of a bidder to accept this adjustment will result in the forfeiture of their bid bond, if the bidder is selected by the Owner for award of a contract.

The total amount paid for Mobilization will not exceed the contract amount for Mobilization, regardless of whether the Contractor shuts down the work before its completion, hauls away equipment and materials, and returns equipment to the project site. The amount of Mobilization will not be adjusted if additional work is added to the project.

Mobilization will be paid for by partial payments of the contract lump sum amount, in accordance with the following:

	Percent of Contract Price for
Percent of Original Contract Earned	Mobilization Allowed
5	50
10	75
25	100

SECTION 01 71 23.16 CONSTRUCTION STAKING BY CONTRACTOR

PART 1 - GENERAL

1.01 Work Included

The Contractor is responsible to provide all staking and layout necessary for construction of the project.

1.02 Notifications

In the event that it appears there is an error or contradiction between plan grades, construction stakes, and/or actual conditions, the Contractor shall notify the Owner or Engineer immediately.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Requirements

The Contractor is responsible to provide such layout and control work as may be required for construction of the proposed improvements.

The Contractor shall provide workers competent in the layout and control work necessary. The Contractor shall provide the equipment and materials necessary for establishing the necessary control and layout.

Pipelines, 8 inches or larger that are to be laid at a uniform grade, shall be laid using a laser for alignment control.

3.02 Plan Grades and Alignment

The horizontal alignment of manholes and drainage structures will be from the center of casting, unless otherwise noted.

Final casting elevation for drainage structures and manholes shall be determined by the Engineer after grading is completed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of Construction Staking will be paid for at the contract unit price for the following pay item(s).

Pay ItemPay UnitConstruction StakingLump Sum

4.02 Measurement

The work of Construction Staking includes furnishing all labor, equipment, supervision, and materials to provide staking and layout for construction of the proposed work. The lump sum amount will be paid proportionally to the work completed on the project, as a percentage of the total contract amount.

SECTION 02 21 14 COLOR AUDIO-VIDEO SURVEY OF CONSTRUCTION AREAS

PART 1 - GENERAL

1.01 Work Included

The Contractor shall perform an audio-video survey of the project area to document the "preconstruction" conditions of the project and adjacent areas. The recording shall be in digital format, delivered to the Engineer on a flash drive or via a downloadable link.

1.02 Qualifications

The pre-construction video documentation shall be completed by an established commercial firm known to be skilled and regularly engaged in the business of color audio-video construction documentation. The firm shall furnish such information as the Engineer deems necessary to demonstrate the ability to perform the work in accordance with contract specifications. This information may include a history of construction work experience.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 General

The Contractor shall provide all labor, materials, equipment, and services and perform all operations necessary to furnish to the Owner a complete color audio-video recording of the surface features within the proposed construction zone of influence. The audio-video survey shall be recorded in digital format with each file labeled to indicate the project name, date, and time and the specific locations included in the file. The purpose of this coverage shall be to accurately document the pre-construction condition of these surface features.

A. Coverage

The recordings shall include coverage of all surface features located within the construction zone of influence. The surface features within the construction zone of influence shall include, but not be limited to, all roadways, pavements, curbs, driveways, sidewalks, culverts, buildings, landscaping, trees, shrubbery, and fences. Any faults, fractures, or defects shall be identified, verbally described, and magnified to clearly show the nature and extent of the damage.

Houses and buildings shall be identified visually by house or building number, when possible, in such a manner that the progress of the taping and proposed construction areas may be located by reference to the house and buildings.

B. Recording Operation

The operator in charge must have experience on at least 25 miles of pre-construction work and/or other similar construction work. Apprentice operators must be continuously supervised by an experienced operator.

C. Recording Schedule

The recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site. The Contractor shall notify the Engineer at least two working days prior to performing the work.

D. Video Delivery

The Contractor shall deliver the audio-video recordings and log to the Owner upon their completion. Upon acceptance by the Owner, the materials become the property of the Owner.

E. Unacceptable Documentation

The Owner may reject all or any portion of the documentation not conforming to specifications. Those rejected portions shall be re-done at no additional cost to the Owner.

F. Documentation Additions and Omissions

The Owner may designate areas to be added to or omitted from the survey.

G. Specification Deviations

Any deviation from these specifications must have the written approval of the Owner/Engineer.

3.02 Production Requirements

The following procedures shall be implemented in the production of pre-construction color audio-video documentation.

A. Recording

The coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area and continues to the other end of that construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, the recording shall consist of an organized, logical sequence corresponding to the plans.

B. Vehicle Rate of Travel

The vehicle rate of travel shall be indirectly proportional to the number, size, and value of the surface features within that construction area's zone of influence.

C. Visibility

All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only be done when sufficient sunlight is present to properly illuminate the subjects of recording and to produce bright, sharp video recordings of those subjects.

No recording shall be performed when there is any snow cover, unless otherwise authorized by the Owner.

3.03 Technical Requirements

The total audio-video recording system and the procedures used shall produce a finished product that will meet the technical requirements of the project and provide a high quality audio and video production. The video portion of the recording shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls, or any other form of picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity, and be free from distortion, interference, or background noise.

A. Recording System

1. Digital File

The recorded audio-video digital file shall be compatible for playback with any standard media player.

2. Recorder

The recorder shall record the color signal with a minimum horizontal resolution of 240 lines.

All video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording, the engineering stationing corresponding to the stationing on the plans or as directed by the Engineer, the name of the street, easement, or building being documented, and the project and time to appear in the upper left hand corner of the picture.

Example: N on First Street W/E 84+20

3. Audio Record

There shall be a corresponding and simultaneously recorded audio recording, containing the commentary of the camera operator. The audio recording shall assist the viewer orientation and in any needed identification, differentiation, clarification, or objective description of the structures being shown in the video portion of the recording.

The audio recording shall be free of any other voice communication.

At the start of production and the beginning of a new street, an identification summary shall be read into the record while at the same time a wide angle view with numeric displays is provided for fiscal record. Summary to include: name of job, location of job, positional location at start of job date, time, weather, and other notable conditions.

4. Camera

The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45 decibels, and a minimum illumination requirement of 25-foot candles.

The camera shall be adjusted to provide optimum contrast. White balance pedestal, level, and synchronization shall be adjusted for optimum performance under environmental conditions.

a. Camera Height and Stability

When conventional wheeled vehicles are used as conveyances for the recording system, the distance between the camera lens and the ground shall be not less than 12 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will maintain a steady picture.

b. Camera Control

Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during playback. In addition, all other camera and recording system controls, such as lens focus and aperture, video level, pedestal, chrome, white balance, and electrical focus, shall be properly controlled or adjusted to maximize recorded picture quality.

- i. A wide angle of area will be shown first, then a series of pans, zooms, and tilts as may be necessary to accomplish a comprehensive view. Close-ups shall be utilized, as necessary, to ensure sufficient detail of items of interest. Progress shall continue linearly along the field of view; for example, one side of roadway must be completed before commencing recording of the opposite side.
- ii. Camera pans and tilts shall be no faster than 90 degrees of arc in a 5-second interval, or slower, so as to assure maximum clarity of scene detail.
- iii. Camera zoom shall be no faster than a doubling of focal distance within a half-second interval, or slower.
- iv. Each item of interest shall be clearly indicated in the video record for sufficient time to permit audio discussion and viewer comprehension.

5. Video Tape Indexing

a. Video Identification

All video files shall be properly identified by index number, project title, and general project location.

b. Flash Drives

Displayed on the flash drive or storage case of each flash drive shall be the project name. A log of the flash drive contents shall be provided along with the flash drive. The log shall describe the segments of coverage contained on the video, in terms of the names and sides of the streets or easements, coverage beginning, direction, and endpoints with corresponding video counter numbers.

c. Cumulative Index

A cumulative alphabetical index of all the individual segments of coverage, indicating the corresponding video file, shall be supplied to the Owner.

All equipment, accessories, and materials to perform this service shall be furnished by the Contractor, except the plans of the proposed area to be televised, which are furnished by the Engineer.

PART 4 - MEASUREMENT AND PAYMENT

The work of color audio-video survey of construction areas is included in the pay item(s) specifically listed on the proposal and will not be paid for separately.

SECTION 02 41 13.13 PAVEMENT REMOVAL

PART 1 - GENERAL

1.01 Work Included

This work includes removal of an existing pavement, including streets, driveways, sidewalks, curb and/or gutter, and parking areas. For purposes of the work "pavement removal", pavement material may include HMA, concrete, brick, or any combination thereof, including any reinforcement materials.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Limits of Removal

Pavement shall be removed to the limits shown on the plans, or as directed by the Engineer in the field. Where pavement is to be removed to allow for the construction of utilities or other improvements, pavement shall be removed to the limits required for their construction.

3.02 Pavement Removal (Including Curb and Gutter Removal)

Pavement shall be removed to an existing joint or to a sawed joint. An existing crack is not suitable for the limit of removal. Sawed joints for pavement removal are to be either parallel or perpendicular to the longitudinal centerline. Sawed joints shall extend substantially through the full thickness of the pavement so that a "clean break" is made and that the adjacent pavement or structures that are to remain are not damaged. If adjacent pavement or structures that are to remain are damaged as a result of the Contractor's removal operations, they shall be replaced to the Owner's satisfaction at the Contractor's expense.

Curb and gutter removal shall be as directed by the Engineer. The Contractor shall sawcut existing curb and/or gutter perpendicular to and completely through the existing concrete.

Broken concrete, HMA, brick, and other debris resulting from pavement removal operations shall become the Contractor's property and disposed of properly.

Where pavements are encountered that are composed of more than one material or multiple courses of the same material, the pavement shall be removed in its entirety and all components shall be considered part of the same pavement area.

The Contractor shall provide sufficient barricades and fences to protect pedestrians and vehicles from hazardous areas.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of pavement removal will be paid for at the contract unit price for the actual quantities of the following pay item(s) which are completed.

Pay ItemPay UnitCurb and Gutter, RemFootPavt, RemSquare YardSidewalk, RemSquare Yard

The work of removing pavement, curb and gutter, or sidewalk includes sawcutting, hauling and disposal, barricading, and all labor and equipment required.

Where pavement and an adjacent curb or curb and gutter are to be removed, both will be paid for as pavement removal. Curb and gutter removal will be paid for separately only when the adjacent pavement (both sides to remain, if existing pavement is on both sides) is to remain.

Removing pavement includes removal of pavement of any material or thickness encountered. Multiple pavement courses or pavement materials will not be paid for separately. Reinforced pavement will be included as pavement removal.

Removing sidewalk includes the removal of sidewalk designated for removal, regardless of the thickness. There will be no adjustment in price if the existing concrete sidewalk is reinforced.

HMA curbs and HMA sidewalks, paths, or trailways will not be paid for separately.

4.02 Measurement

Pavement removal and sidewalk removal will be measured by horizontal surface area in units of square yards.

Curb and gutter removal will be measured linearly along the base of the curb face or along the flowline of the gutter, when the adjacent pavement is not to be removed.

SECTION 02 61 00 NON-HAZARDOUS CONTAMINATED MATERIAL DISPOSAL

PART 1 - GENERAL

1.01 Work Included

This work includes all labor, equipment, and materials necessary to handle, transport, and dispose of the non-hazardous contaminated material, including any and all laboratory testing required for the proper disposal of the material.

1.02 References

A. Hazardous Waste Management Act, Act 64, P.A. 1979

1.03 Related Work

A. Section 31 23 01 – Excavating, Filling, and Grading

1.04 Submittals

A. Disposal Facility

The Contractor shall provide the Engineer with the name and address of the Type II Sanitary Landfill which is proposed for disposal of contaminated non-hazardous material. The Contractor shall indicate if the proposed landfill is included in the county's solid waste disposal plan.

B. Composition Analysis

The Contractor shall provide the Engineer with the results of composition testing completed on any material potentially considered contaminated non-hazardous material.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Excavation of Non-Hazardous Contaminated Material

Non-hazardous contaminated material shall be excavated as shown on the plans or as directed by the Engineer.

3.02 Temporary Storage of Non-Hazardous Contaminated Material

Excavated non-hazardous contaminated material, which is to be temporarily stockpiled, shall be placed on plastic sheeting or tarps having a minimum thickness of 6 mils or in trucks, roll off boxes, or other containers, such that no liquid may escape from the containment. At the end of each work day, the non-hazardous contaminated material shall be covered securely with plastic sheeting of 6-mil thickness or greater.

Excavated non-hazardous material shall be disposed of as soon as approval is received from the disposal site. In no case shall this material be stockpiled for longer than 30 days prior to disposal.

3.03 Sampling and Analysis of Non-hazardous Contaminated Material

The Contractor shall be responsible for all sampling and analysis required for disposal of non-hazardous contaminated material, as required by the proposed disposal facility.

If the results of the analysis show the material to be hazardous, as defined by the Hazardous Waste Management Act, Act 64, P.A. 1979, the Engineer shall be notified immediately. The material shall then be disposed of as directed by the Engineer.

3.04 Disposal of Non-hazardous Contaminated Material

Disposal of non-hazardous contaminated material shall be at a licensed Type II Sanitary Landfill. The Contractor shall provide the Engineer the name of the Type II Sanitary Landfill to be used for disposal, the sampling analysis requirements of that landfill, and verification that the proposed landfill will meet the requirements of the county solid waste plan.

The Contractor shall provide a copy of the laboratory analysis to the Engineer. Following disposal and prior to approval for payment, the Contractor shall provide landfill receipts to the Engineer for all disposed non-hazardous contaminated material.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The completed work, as measured for Non Haz Contaminated Material Handling and Disposal, will be paid for at the contract unit price for the following pay item(s), if specifically included on the proposal.

<u>Pay Item</u>

Non Haz Contaminated Material Handling and Disposal

Cubic Yard

4.02 Measurement

Non Haz Contaminated Material Handling and Disposal will be measured by cubic yards. Prior to payment, the Engineer shall be provided receipts from the disposal facility for the number of cubic yards disposed at that facility.

4.03 Work Included

The work of Non Haz Contaminated Material Handling and Disposal includes all costs for materials, labor, and equipment needed for storage, loading, transportation, testing, and disposal of the non-hazardous contaminated material. Disposal costs shall include all documentation required by the landfill.

Delays in testing and disposal of non-hazardous contaminated materials, that are not the fault of the Contractor, may be considered valid reasons for extension of time. However, these delays and the resultant extensions of time will not be considered valid reasons for additional payment.

SECTION 31 10 01 CLEARING AND REMOVAL OF MISCELLANEOUS STRUCTURES

PART 1 - GENERAL

1.01 Work Included

This work includes, but is not limited to, clearing, topsoil removal, tree and stump removal, and the removal and protection of miscellaneous items within the project area.

1.02 Related Work

- A. Section 02 41 13.13 Pavement Removal
- B. Section 33 42 00 Culverts

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 Location of Underground Utilities

The Contractor shall call MISS DIG at least three work days before excavating in an area so that utility companies can identify their buried utilities. The Contractor shall notify area municipalities and other utilities in the area that do not participate in the MISS DIG program for location of their utilities.

3.02 Stripping and Stockpiling of Topsoil

Prior to excavating, the existing topsoil surface shall be stripped and stockpiled from within the limits of the proposed excavation.

3.03 Removal of Fences, Signs, Mailboxes, Ornaments, and Other Objects

Fences, signs, and similar objects that fall within the project area shall either be protected or removed. If removed, the materials shall be carefully taken apart and stored in a place where they will not be damaged or stolen.

Traffic signs shall not be removed unless approved by the agency responsible for them. If approved for removal, traffic signs and posts shall be reinstalled in accordance with the requirements of the agency responsible for them.

If any of the materials to be removed are damaged or badly deteriorated before the Contractor removes them, the Contractor shall notify the Engineer before the object is removed. Materials that are damaged, stolen, or lost after they have been removed shall be replaced by the Contractor at no increase in project cost.

3.04 Conflicts with Utility Poles

Where the proposed excavation requires that a pole or guy be supported or temporarily relocated, the Contractor shall make arrangements with the appropriate utility to have the pole or guy supported or relocated. Any costs for this shall be the Contractor's expense.

If the Contractor supports the pole or relocates the guy themselves, the method used shall meet the approval of the appropriate utility. The Contractor shall be solely responsible for any supporting work to the utility company.

3.05 Trees and Brush

Brush lying within the limits of the proposed excavation shall be cleared by the Contractor. Brush shall be removed from the project area and disposed of properly.

Trees lying within the limits of the proposed excavation that are to be removed shall be cut down by the Contractor. Plans may not show all trees of all nature and the Contractor shall become familiar with the project and base their work on their own assessment. The Contractor shall coordinate with the Owner as to which trees are to be left in place and those that will be acceptable to remove.

Small branches, limbs, and other debris shall be removed from the area by the Contractor and disposed of properly. If the landowner does not want wood from the trees, all wood including branches, limbs, and other debris shall be removed from the area by the Contractor and disposed of properly.

Stumps shall be removed in their entirety and disposed of away from the project area in an acceptable manner. Burning or burying along the project route is not acceptable.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of clearing and removal of miscellaneous structures will be paid for at the contract price for the actual quantity of the following pay item(s), which have been specifically included on the proposal as pay item(s) and have been authorized and completed.

Pay ItemPay UnitClearingLump SumMisc Structures, RemLump Sum

Work not specifically listed on the proposal as a pay item is considered included in the pay item(s) listed on the proposal and will not be paid for separately.

4.02 Measurement

Where the work of Clearing is specifically listed on the proposal as a pay item in units of lump sum, the work of Clearing will include all clearing of whatever nature necessary for completing

the project. The lump sum pay item will be measured proportionally to the total length or area to be cleared for purposes of progress payments.

The work of removing miscellaneous structures will be measured as a lump sum item, regardless of the total quantity of items or the nature of items to be removed.

4.03 Work Included

The work of Clearing includes removing brush and trees within the project limits, except those which are designated to be protected. This work includes the proper disposal materials resulting from the removal of brush and trees.

The work of removing miscellaneous structures includes removing structures or items within the project area which interfere with the proposed construction activities or are designated for removal on the plans or by the Engineer. This work includes properly disposing of the items or materials for those items which are to be disposed of by the Contractor. For those items which are to be replaced or salvaged, the work of removing miscellaneous structures includes carefully removing and/or taking the item apart and safely storing it.

SECTION 31 23 01 EXCAVATING, FILLING, AND GRADING

PART 1 - GENERAL

1.01 Work Included

The work of excavating, filling, and grading includes, but is not necessarily limited to:

- A. Excavating for footings and foundations;
- B. Filling and backfilling to attain indicated grades;
- C. Trenching and trench backfilling;
- D. Rough and finish grading of the site; and
- E. Furnishing and installing granular cushion under concrete slabs on grade.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- B. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

- A. Section 01 41 26 Permit Requirements
- B. Section 01 45 16.02 Density and Aggregate Testing
- C. Section 02 41 13.13 Pavement Removal
- D. Section 31 25 00 Soil Erosion and Sedimentation Control

1.04 Job Conditions

A. Dust Control

Dust caused by the Contractor's operations during performance of the work, or resulting from the condition in which the Contractor leaves the site, shall be controlled by the Contractor. The Contractor shall use all means necessary to control dust on and near the work zone and all off-site borrow areas.

All surfaces shall be thoroughly moistened, as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the site.

B. Protection

The Contractor shall use all means necessary to protect all materials before, during, and after installation and to protect all objects designated to remain.

In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

C. Safety

The Contractor is responsible for conducting operations in a safe and orderly manner and in conformance with MIOSHA P.A. 154.

D. Permits

Unless otherwise provided, the Contractor is responsible to obtain and comply with permits required under Parts 31 and 91 of Michigan PA 451 of 1994 (Natural Resources and Environmental Protection Act) and any local ordinances.

PART 2 - PRODUCTS

2.01 Fill Material – General

All fill material shall be subject to the approval of the Engineer.

For approval of fill material, notify the Engineer at least four working days in advance of intention to import material, designate the proposed borrow area, and permit the Engineer to sample, as necessary, from the borrow area for the purpose of making acceptance tests to prove the quality of the material.

2.02 Fill, Trench, and Structural Backfill Material

Fill material, unless specified otherwise, shall be soil or soil-rock mixture that is free from organic matter and other deleterious substance. It shall contain no rocks or lumps over 6 inches in greatest dimension and not more than 15 percent of the rocks or lumps shall be larger than 2½ inches in greatest dimension.

Fill material obtained from offsite sources shall meet the requirements of the preceding paragraph and additionally, shall be predominantly granular with a maximum particle size of 2 inches and a plasticity index of 12 or less.

Fill material placed within 2 feet horizontally of the base of building foundations and/or slabs shall have a plasticity index of 15 or less.

2.03 Sand

Sand shall meet the requirements of Granular Material Class II, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.04 Granular Cushion

Granular cushion under slabs shall meet the requirements of Granular Material Class II, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.05 Sand for Backfill

Sand shall meet the requirements of Granular Material Class II, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.06 Stone for Pipe Bedding

Stone shall meet the requirements of Series 6AA aggregate, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.07 Stone for Backfill

Stone shall meet the requirements of 21AA crushed aggregate or 4G open-graded aggregate, as specified in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.08 Flowable Fill

Flowable fill shall be a mixture of Portland cement, fly ash, sand, and water in the following proportions.

Flowable Fill Mixture Ratios				
Material	Туре	Quantity		
Portland Cement	Type I or IA	50 lb/cyd		
Fly Ash	ASTM C618, Class C or F	500 lb/cyd		
Sand	MDOT 2NS	2,850 lb/cyd		
Water		Approx. 376 lb/cyd		
		(sufficient to produce desired flowability)		

Flowable fill shall be produced and delivered at a minimum temperature of 50 degrees Fahrenheit. Mixtures shall be transported to the point of placement in a revolving drum mixer or agitator.

2.09 Geotextile

Geosynthetics must be composed of long-chain synthetic fiber of at least 85 percent, by weight, polyolefins or polyesters. Geosynthetics must be capable of resisting degradation from chemicals, mildew, rot, and ultraviolet (UV) light.

Geotextile used to prevent intermixing of soft subgrade and subbase materials shall meet the requirements per the Michigan Department of Transportation 2020 Standard Specifications for Construction, as shown in Table 910-1 for geotextile stabilization and separator.

2.10 Other Materials

All other materials not specifically described, but required for a complete and proper installation, shall be as selected by the Contractor and subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 General

Prior to all work of this section, the Contractor shall become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this section. The Contractor shall not allow or cause any of the work performed or installed to be covered up or enclosed by work of this section prior to all required inspections, tests, and approvals. Should any of the work be enclosed or covered up before it has been approved, the Contractor shall uncover all such work at no additional cost to the Owner. After the work has been completely tested, inspected, and approved, the Contractor shall make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the Owner.

The Contractor shall excavate ahead of the proposed utility installation to expose any existing buried utilities. If existing utility grades conflict with the proposed utility grade, the proposed utility grade may be adjusted by the Engineer, if necessary, to miss the existing utility grade at no additional expense to the contract.

3.02 Geotextile Stabilization and Geotextile Separator

Deliver and store geosynthetics in packaging capable of resisting UV radiation, contaminants, and moisture. Label each unit of material with product information, including supplier and lot identification. Do not expose geosynthetics to direct sunlight for prolonged periods. Repair or replace damaged geosynthetics at no additional cost to the project.

A. Geotextile Placement

Place or install geotextile products in accordance with the manufacturer's installation guidelines and this subsection.

Do not operate equipment required to place backfill directly on geotextile products. Eliminate wrinkles or waves that develop during placement. Place the products in direct contact with the soil below before placing backfill on the geotextile products.

Shingle-lap longitudinal and transverse joints at least 2 feet, or seam the joints in accordance with the manufacturer's recommendations. Ensure field or factory seams meet the minimum grab tensile strength for the product application. Place seams facing upward for inspection purposes.

Repair tears or damage to the geotextile in accordance with the manufacturer's recommendations.

B. Aggregate or Granular Material Placement

Spread and grade the first layer of aggregate or granular material after placing geotextile to create a stable work platform before compaction. Place additional aggregate or granular material, as required, and compact. Fill ruts with additional aggregate or granular material and compact before placing each subsequent layer. The cost of aggregate or granular material, including additional quantities required to fill ruts, is included in the unit prices for related pay item(s).

3.03 Excavating

Where depressions result from, or have resulted from, the removal of surface or subsurface obstructions, the Contractor shall open the depression and remove all debris and soft material as directed by the Engineer.

The Contractor shall excavate to the grades shown on the drawings. Where excavation grades are not shown on the drawings, excavation shall be completed, as required, to accommodate the installation.

All over-excavated areas shall be backfilled and compacted at no additional cost to the Owner.

3.04 Preparation of Subgrade

After the site has been cleared, stripped, and excavated to within 6 inches of the specified depths for recompaction, the exposed surface shall be scarified to a minimum depth of 6 inches, thoroughly moisture-conditioned, and compacted to the requirements specified below for fill.

All ruts, hummocks, and other uneven surfaces shall be removed by surface grading prior to placement of fill.

3.05 Subgrade Undercutting

Subgrade undercutting shall be performed to replace material susceptible to frost heaving, differential frost action, or unstable soil conditions, as determined by the Engineer.

After the subgrade has been excavated to the approximate grade, the Engineer will inspect the grade to determine if subgrade undercutting is required and to determine the limits of such undercutting. The Contractor shall provide suitable equipment for proof rolling the grade. The inspection, proof rolling, and subgrade undercutting shall be completed prior to placing any embankment, road base, or pavement.

The Contractor shall undercut the subgrade within the limits defined by the Engineer. All excavated material resulting from the undercutting shall become the Contractor's property disposed of outside the project limits, unless otherwise directed. The volume of earth removed by subgrade undercutting shall be replaced by suitable soils as follows:

- A. Type I Subgrade Undercutting backfill with selected clay or similar material approved by the Engineer.
- B. Type II Subgrade Undercutting backfill with sand.

C. Type III Subgrade Undercutting

Backfill with the material excavated from subgrade undercut areas after mixing the excavated material to break up the undesirable strata of soils or with other Engineer-approved backfill material.

D. Type IV Subgrade Undercutting

Backfill with 21AA crushed aggregate or 4G open-graded aggregate. Encapsulate 4G aggregate with geotextile separator.

Backfill material shall be compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

3.06 Excess Water Control

Fill material shall not be placed, spread, or rolled during unfavorable weather conditions. Operations shall not resume until moisture content and fill density are satisfactory to the Engineer. Berms or channels shall be provided to prevent flooding of subgrade. All water collecting in depressions shall be promptly removed.

Where soil has been softened or eroded by flooding or placement during unfavorable weather, all damaged areas shall be removed and compacted as specified below for fill and compaction.

The Contractor shall provide suitable means and equipment to maintain excavations and other parts of the work free from water.

Dewatering means and methods shall provide dry excavations and the preservation of the final lines and grades of bottoms of excavations.

3.07 Fill and Compaction

After subgrade compaction has been approved by the Engineer, the Contractor shall place approved fill material in layers not exceeding 8 inches in uncompacted thickness.

The fill material shall be watered or aerated, as necessary, and thoroughly mixed to obtain a moisture content that will permit proper compaction.

Each soil layer shall be compacted to at least the specified minimum degree. The filling and compaction process shall be repeated until plan grade is attained.

A. Compaction Requirements

Unless otherwise specified on the drawings or in other sections of the specifications, fill and backfill shall be placed in 8-inch lifts and each lift shall be compacted to not less than the percentages of the maximum density stated in Section 01 45 16.02 – Density and Aggregate Testing.

Compaction by jetting will not be permitted unless specifically authorized by the Engineer.

3.08 Grading

Except as otherwise directed by the Engineer, the Contractor shall perform all rough and finish grading required to attain the elevations shown on the drawings.

Tolerances For Grading			
Rough Grade		Finish Grade	
Building, roads, and parking areas	Plus or minus 0.1 feet	Granular cushion under concrete slabs	Plus or minus 0.05 feet
Landscaped areas	Plus or minus 0.25 feet	Parking areas	Plus or minus 0.03 feet
		Landscaped areas	Plus or minus 0.1 feet

After grading is completed and has been accepted by the Engineer, the Contractor shall permit no further excavating, filling, or grading.

The Contractor shall use all means necessary to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

3.09 Excavating for Footings

Earth surfaces, upon which footings will be placed, shall be compacted in accordance with the compaction requirements established in this section of these specifications.

The Contractor shall verify that all compaction is complete and approved prior to excavating for footings.

The Contractor shall excavate to the required lines and grades. The bottom of trenches shall be cut level and all loose soil shall be removed. Where soft spots are encountered, unsuitable materials shall be removed and replaced with flowable fill at no additional cost to the Owner.

3.10 Placing Granular Cushion

The Contractor shall carefully place the specified granular cushion in areas to receive concrete slabs on grade, uniformly attaining the thickness indicated on the drawings, and providing all required transition planes.

3.11 Trenching

The Contractor shall perform all trenching required for the installation of items where the trenching is not specifically described in other sections of these specifications.

All trenches shall be open construction, with sufficient width to provide free working space at both sides of the trench and around the installed item as required for pipelaying, backfilling, and compacting.

Trenching shall be completed, as required, to provide the elevations shown on the drawings. Where elevations are not shown on the drawings, trench to sufficient depth to give a minimum of 18 inches of fill above the top of the pipe, measured from the adjacent finished grade.

Where trench excavation is inadvertently carried below proper elevations, the over-excavated area shall be backfilled with material approved by the Engineer, and then compacted to provide a firm and unyielding subgrade and/or foundation to the approval of the Engineer and at no additional cost to the Owner.

The Contractor shall properly support all trenches in accordance with all applicable rules and regulations.

The Contractor shall brace, sheet, and support trench walls in such a manner that they will be safe and that the ground alongside the excavation will not slide or settle, and that all existing improvements of every kind, whether on public or private property, will be fully protected from damage.

In the event of damage to such improvements, the Contractor shall immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

Bracing, sheeting, and shoring shall be constructed so as to not place stress on any portion of the completed work until the general construction thereof has proceeded far enough to provide sufficient strength. The Contractor shall exercise care in the drawing and removal of sheeting, shoring, bracing, and timbering to prevent collapse and caving of the excavation faces being supported.

Trenched material shall be stockpiled in a manner to prevent water running into the excavations. Surface drainage shall not be obstructed. A means shall be provided whereby storm and wastewaters are diverted into existing gutters, other surface drains, or temporary drains.

3.12 Foundation for Pipes

Trench bottoms shall be graded to provide a smooth, firm, and stable foundation free from rock points throughout the length of the pipe.

A minimum of 4 inches of sand or stone bedding shall be placed in the bottom of the trench.

In areas where soft, unstable materials are encountered at the surface where the bedding is to be placed, the unstable material shall be removed and replaced with material approved by the Engineer. The area shall be undercut to a sufficient depth to develop a firm foundation for the item being installed. Over excavation and replacement of material shall be the responsibility of the Contractor and shall be completed at no additional cost to the Owner.

At each joint in pipe, the bottom of the trench shall be recessed, as required, to relieve the bell of the pipe of all load and to ensure continuous bearing of the pipe barrel on the firm foundation.

The pipe subgrade shall be shaped to fit the bottom of the trench to the pipe shape.

3.13 Bedding for Pipes

Pipe bedding shall be in accordance with the details in the construction plans.

The pipe bedding shall be shaped to match the bottom ¼ of the pipe's shape. The bedding shall be excavated to accommodate the pipe bells. The completed bedding shall provide uniform support of the entire length of pipe.

The bedding material shall be compacted after placing along both sides of the pipe.

3.14 Backfill for Pipes

Unless otherwise directed, all trenches and excavation shall be backfilled as the pipe is laid. No pipes shall be backfilled until the sewer elevations, gradient, alignment, and the pipe joints have been observed by the Engineer.

The trench shall be backfilled to the proposed final elevations with suitable materials. Unless other compaction methods are demonstrated and approved by the Engineer, backfill shall be placed in 8-inch lifts and compacted to the required density as stated in Section 01 45 16.02 – Density and Aggregate Testing.

In areas which are not to be restored with a pavement or aggregate surface, the backfill shall be graded to a height slightly above the adjacent surface. When final restoration of the area is completed by the Contractor, the backfill surface shall be excavated (or filled if settlement has occurred), trimmed, or graded, as necessary, to provide for the required depth of topsoil and its transition to adjacent, undisturbed areas.

The Contractor shall correct any areas where the trench backfill settles by adding fill, topsoil, and re-seeding.

3.15 Miscellaneous Pipe Repair

When an existing sewer pipe, drain pipe, field tile, or other existing pipe is damaged as a result of construction activities and is not designated for removal or abandonment on the plans or by the Engineer, it shall be repaired by the Contractor.

The section of damaged pipe shall be removed to existing joints or to sawed joints where the existing pipe is sound and undamaged. A length of new pipe of the same size as the original pipe shall be furnished and installed to replace the section of pipe removed. The new pipe may be any one of the following materials:

- A. Same material, class or thicknesses, as the original pipe
- B. PVC Schedule 40, for pipes 8 inches or less in diameter
- C. PVC SDR 26, for pipes 8 inches or greater in diameter
- D. Other pipe material approved by the Engineer

Each end of the new section of pipe shall be connected to the remaining sections of existing pipe using a rubber gasketed sleeve, suitable for the pipe materials and sizes being joined, to provide a watertight connection. The repaired section of pipe shall be firmly bedded in sand or stone, compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of excavating, filling, and grading will be paid for at the contract unit price for the following pay item(s).

Pay Item Pay Unit Earthwork Lump Sum

4.02 Measurement

The work of miscellaneous pipe repair will not be paid for separately.

The work of Dewatering will be considered a lump sum pay item. The lump sum price for Dewatering will be paid in partial payments, proportional to the amount of utility which has been constructed and accepted. Dewatering will be paid for as a separate pay item when it has been included as a pay item on the proposal. Otherwise, Dewatering is considered to be included in the work of the other pay item(s) and will not be paid for separately.

The work of Earthwork will be considered a lump sum pay item.

4.03 Work Included

The work of miscellaneous pipe repair includes all work necessary to repair existing sewer pipes, drain pipes, field tiles, or other existing pipes encountered and damaged by construction activities because their location was not identified or the existing pipes were not in sound condition. Payment for this work includes all labor, materials, and equipment necessary to complete the appropriate repair, including lost production time for performing other work. There will be no adjustment in the unit price for differing types of pipes, materials, classes or thicknesses, or diameters. Existing utilities and pipes, which are either shown on the drawings or located in the field by MISS DIG or the utility agency, are to be located and protected by the Contractor and, if damaged, will not be eligible for payment unless the Engineer determines that the original pipe was not in sound condition before construction.

If included as a pay item, Dewatering will be paid for at the lump sum price bid for providing, installing, maintaining, and removing any wells, pumps, generators, piping, or equipment necessary to control and remove groundwater to provide for the proper construction of the proposed work. The cost of providing power, permits, alternative water supplies, and temporary right-of-way is included in the work of Dewatering.

The work of excavating, filling, and grading includes performing all Earthwork (that is not specifically described elsewhere) necessary to complete the project and includes the following:

- Providing sand or stone aggregate, where required, for bedding, cushion, or fill.
- Disposing of excess excavated material or unsuitable excavated material.
- Providing suitable soil for fill material, when additional soil is necessary to attain the required grades.
- Dust control.
- Compaction of soil and aggregate, including moisture control.

Subgrade undercutting will be paid for only where one of the following conditions occurs.

- A. An embankment is to be constructed on native soils (after topsoil has been removed) that are determined to be unsuitable by the Engineer.
- B. Native soils are unsuitable, as determined by the Engineer, at the plan subgrade elevation in areas where excavation was performed to reach the plan elevation.

In areas where soils would normally be suitable for use in the subgrade, but during the earthwork activities they become unstable because of precipitation or runoff, the Contractor shall remove and replace or dry the soils at their cost. This work will not be considered subgrade undercutting.

Where the drawings provide a summary of estimated Earthwork quantities, the estimates are provided for information only. The Contractor shall verify the Engineer's estimates during the bidding process, and determine the contract price based on their determination of the quantities and the Contractor's planned approach for performing the work.

SECTION 31 25 00 SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 Work Included

The Contractor shall provide permanent and/or temporary erosion and sedimentation control as called for on the plans and as required by the county soil erosion agent and permit.

1.02 Definitions

A. Major rainfall event – $\frac{1}{4}$ -inch or more precipitation over a period, delineated by dry periods of at least 24 hours.

1.03 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ASTM D3786 Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
- B. ASTM D4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
- C. ASTM D4491 Standard Test Method for Water Permeability of Geotextiles by Permittivity
- D. ASTM D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- E. ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- F. ASTM D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
- G. ASTM D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
- H. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.04 Related Work

- A. Section 01 41 26 Permit Requirements
- B. Section 32 92 00 Turf Establishment

1.05 Permit

The Contractor shall apply for and obtain an Act 451 permit from the local Soil Erosion and Sedimentation Control Enforcing Agent. The Contractor shall pay all permit fees and provide any required bonds or insurance.

1.06 Scheduling

- A. Control measures shall be constructed by the Contractor prior to the time construction starts uphill or upstream from the control measure location.
- B. The Contractor shall inspect all temporary erosion control measures weekly and within 18 hours of major rainfall events.
- C. Maintenance and replacement of erosion control measures shall be completed by the Contractor when necessary, or as directed by the soil erosion control agent or the Engineer.
- D. Removal and cleanup of temporary control structures shall be provided by the Contractor within one week after the control measure is no longer needed.

1.07 General Soil Erosion and Sedimentation Content Procedures

- A. Keep disturbed areas small.
- B. Stabilize and protect disturbed areas as soon as possible.
- C. Keep storm water runoff velocities low.
- D. Protect disturbed areas from runoff.
- E. Retain sediment within the construction area.

PART 2 - PRODUCTS

2.01 Materials

A. Geotextiles

Geotextiles for filters shall be non-woven, meeting the requirements of the table below.

Silt fence geotextiles shall meet the requirements of the following table and shall be designed to collect eroded sediment transported in storm water runoff. The fabric shall have at least 70 percent minimum retained strength after 500 hours of U.V. exposure when tested according to ASTM D4355.

	Property/Test Method					
Geotextile Category	Grab Tensile Strength (min) ASTM D4632 Ibs	Trapezoid Tear Strength (min) ASTM D4533 Ibs	Puncture Strength (min) ASTM D4833 Ibs	Mullen burst strength (min) ASTM D3786 psi (a)	Permittivity ASTM D4491 Per second	Apparent Opening Size (max) ASTM D4751 (b) Millimeters
Filters	90	45	45	140	0.5	0.21
Silt Fence	100(c)	45			0.1	0.60

⁽a) ASTM D3786. The fluid displacement rate for the Mullen burst test equipment must be 170 ± 5 ml/minute. Subtract tare strength from the ultimate burst strength as specified by ASTM.

⁽b) Filtration opening size (FOS, Canadian General Standards Board, method 148.1 No. 10) is permitted as an alternate test method to ASTM D4751 for non-woven geotextiles.

⁽c) Elongation at the specified grab tensile strength not to exceed 40 percent for silt fence.

B. Stone

Unless otherwise directed, stone shall meet the requirements of Series 6AA as specified in Michigan Department of Transportation 2020 Standard Specifications for Construction.

2.02 Mixtures

A. Seed

Seed shall meet the requirements of Section 32 92 00 – Turf Establishment.

2.03 Fabricated Items

A. Silt Fence

Geotextile for silt fences shall meet the requirements of Section 2.01. The geotextile shall be attached to machine pointed No. 2 common grade hardwood posts, using at least 5 staples through wood lath a minimum of $^3/_8$ -inch thick and 2 feet long. Post spacing shall not exceed $^61/_2$ feet. Posts must be of sufficient length and cross-section to support the installed silt fence under full sediment load; however, posts shall have cross-sectional area of at least $2^1/_4$ square inches and shall be a minimum of 36 inches in length. Silt fence fabric must be a minimum height of $2^1/_2$ feet. Silt fence shall have at least two permanent markings or affixed labels per assembled roll which positively identifies the fabricator.

B. Mulch Blankets

Mulch blankets shall meet the requirements of Section 32 92 00 - Turf Establishment.

C. Filter Sacks

All materials shall adhere to the requirements of the Michigan Department of Transportation 2020 Standard Specifications for Construction, except fabric drop, which shall consist of a geotextile filter sack inserted into the drainage structure under the cover.

Filter sack shall be as manufactured by "Siltsack", "Catch-All", "Ultra-Urban Filter", "Flogard + Plus", or approved equal. The filter sacks shall be installed and maintained in accordance with the manufacturer's specifications.

PART 3 - EXECUTION

3.01 General Requirements

The Contractor shall perform work on the project in a manner which prevents or reduces erosion and controls sedimentation. The Contractor shall provide controls which keep sedimentation from the project area, within the limits of the project area, and out of any lake, river, stream, wetland, or storm drain.

The Contractor shall install appropriate controls or measures to control or prevent erosion or sedimentation from the project area before beginning any earth disturbance operations. Temporary erosion and sedimentation control measures shall be maintained by the Contractor, until such times as disturbed areas have become permanently stabilized.

During the life of the project, the Contractor shall provide any additional soil erosion or sedimentation control measures necessary to address specific problems which develop in and adjacent to the project area.

3.02 Time Limitations

Grading operations shall be completed as soon as practical. Permanent soil erosion controls for disturbed areas shall be completed within 5 calendar days of the completion of grading, except that permanent measures shall be completed within 24 hours when the disturbed area is within 150 feet of a lake, stream, river, or wetland area.

Temporary soil erosion measures shall be implemented when it is not practical to complete the permanent measures.

3.03 Area Limitations

For linear projects (roads, sewers, water main, etc.), the length of the disturbed area shall be limited to ½-mile, unless otherwise approved by the Engineer.

Areas outside the project right-of-way or outside the grading limits shown on the drawings shall not be disturbed, unless otherwise approved by the Engineer.

3.04 Construction of Erosion and Sedimentation Controls

The Contractor shall provide all permanent and temporary erosion and sedimentation controls shown on the drawings, required by the permitting agency, or necessary to appropriately control erosion and sedimentation from the project area.

A. Check Dams

Check dams shall be installed and maintained across ditches and watercourses, which might convey surface runoff from disturbed areas within the project area, or where shown on the drawings or required by the Engineer or permitting agency.

B. Silt Fence

The Contractor shall furnish, erect, and maintain silt fence around the perimeter of the project area where earth will be disturbed and sediment from the disturbed area could be conveyed.

C. Filters

Fabric or stone filters shall be installed in waterways or in advance of inlets to drainage courses or storm sewers.

D. Sediment Traps and Basins

Sediment traps shall be excavated upstream of check dams and where shown on the drawings or directed by the Engineer or permitting agency. Check dams shall be installed downstream of the sediment traps and basins prior to the sediment traps and basins being excavated.

E. Seeding

Earth areas shall be stabilized with turf immediately following the completion of earthwork and grading activities. Where permanent seeding cannot be completed, earth areas shall be

stabilized with temporary seeding. Areas which are properly seeded temporarily for stabilization shall be permanently seeded, as shown, as the work can be appropriately completed.

F. Mulch Blankets

Areas susceptible to erosion from moving water, which are not to be paved, shall be seeded and protected with high velocity mulch blankets.

3.05 Maintenance and Erosion and Sedimentation Control

The Contractor shall maintain all temporary erosion and sedimentation controls until such time as the permanent measures have been completed and established.

The Contractor shall inspect all erosion and sedimentation controls weekly and within 18 hours of a major rain event.

Damaged controls or measures shall be replaced or repaired. Sediment shall be cleaned from traps, sumps, basins, filters, and fences periodically. Sediment shall be removed to prevent the accumulation of sediment from exceeding half of the volume of traps, sumps, and basins. Sediment or debris along silt fences shall be removed before the accumulation reaches half the height of the fence.

Sediment and debris removed from soil erosion and sedimentation control devices shall be disposed of properly by the Contractor. Sediment shall not be used for fill or backfill in the project area, except when an area is specifically designated on the plans or by the Engineer.

Drainage filters shall be cleaned when an accumulation of silt might reduce flow and result in flooding.

Any sediment from the construction area which enters storm sewers or drainage ditches shall be removed by the Contractor. Since sediment can be carried great distances within storm sewers, it may be necessary for many segments of downstream storm sewer segments to be televised, jetted, and vacuumed. If the Engineer believes that the Contractor has allowed or provided the potential for sediment to enter storm sewers or drainage courses, the Contractor will be responsible for the costs of inspection and removing sediment from downstream drains, whether it can be conclusively proven that the sediment was the result of the Contractor's actions (or inaction).

3.06 Removal of Erosion and Sedimentation Control Devices

Temporary soil erosion and sedimentation control devices shall be removed or obliterated by the Contractor when the permanent measures are in place and established. Any areas damaged by the removal of the temporary devices shall be corrected by the Contractor.

Mulch used for temporary erosion control may either be removed or worked into the soil before the permanent topsoil and seeding is completed.

PART 4 - MEASUREMENT AND PAYMENT

The work of erosion control will be paid for at the contract unit price for the actual quantity of the following pay item(s), which are shown on the drawings or authorized by the Engineer and are specifically listed as pay item(s) on the proposal.

<u>Pay Item</u>	<u>Pay Unit</u>
Erosion Control, Gravel Access Approach	Each
Erosion Control, Inlet Protection, Fabric Drop	Each
Erosion Control, Silt Fence	Foot

Work not specifically listed as a pay item is considered included in the pay item(s) specifically listed on the proposal and will not be paid for separately. This work includes providing and maintaining all erosion and sedimentation control measures shown on the plans, required by the permitting agency, or necessary to minimize erosion and sedimentation from the project area. This work also includes removal of temporary controls once the permanent measures have become established.

SECTION 32 11 23 AGGREGATE BASE

PART 1 - GENERAL

1.01 Work Included

This specification describes the requirements for constructing an aggregate base under a proposed pavement surface.

1.02 References

A. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

A. Section 01 45 16.02 – Density and Aggregate Testing

PART 2 - PRODUCTS

2.01 Materials

A. Aggregate shall meet the requirements of Series 21AA aggregate, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction, unless otherwise noted on the plans, proposal, or specifications.

PART 3 - EXECUTION

3.01 Subgrade Preparation

Aggregate shall not be placed until the subgrade is properly prepared. The subgrade shall be graded to the required elevations and shape for placement of the specified aggregate thickness. The subgrade shall be compacted according to Section 01 45 16.02 — Density and Aggregate Testing. Soft or yielding spots shall be excavated and replaced with sound material.

3.02 Placement

Aggregate shall be placed in a manner that provides a uniform cross section of the specified thickness and the required surface grades. The edges of the area of aggregate surface shall be straight and uniform.

Aggregate shall be placed in lifts not exceeding 8 inches (loose measure) and compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

Aggregate base will be paid for at the contract unit price for the actual quantity of the following pay item(s) constructed.

Pay Item		<u>Pay Unit</u>
Aggregate Base,	_ inch	Square Yard

The pay item(s) include furnishing the material, preparing the subgrade, and placing, compacting, and grading the aggregate base.

4.02 Measurement

Aggregate base will be measured by surface area to the pay limits as shown on the plans. Aggregate base placed outside of pay limits shall not be eligible for payment. Areas where the compacted depth of aggregate is less than the depth specified will not be paid for. The Contractor shall provide the Engineer with weight tickets at the time of delivery to the project site.

SECTION 32 13 00 CONCRETE CURB AND GUTTER, SIDEWALK, AND MISCELLANEOUS PAVEMENT

PART 1 - GENERAL

1.01 Work Included

This work includes all preparation, forming, concrete production and placement, finishing, jointing, reinforcing, curing, protection, and restoration for the construction of concrete curb and gutter, sidewalk, and miscellaneous pavement.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ASTM A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- B. ASTM C94 Standard Specification for Ready-Mixed Concrete
- C. ASTM C150 Standard Specification for Portland Cement
- D. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- E. ASTM A706, ASTM A615, or ASTM A996 (Type R or Type A only) for Grade 60 steel bars
- F. ASTM A775 for epoxy coated steel reinforcement
- G. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- H. Michigan Department of Transportation 2020 Standard Specifications for Construction
- I. Michigan Department of Transportation Standard Plan

1.03 Related Work

- A. Section 01 45 16.01 Concrete Testing
- B. Section 01 45 16.02 Density and Aggregate Testing
- C. Section 02 41 13.13 Pavement Removal

PART 2 - PRODUCTS

2.01 Materials

A. Portland cement shall meet the requirements of ASTM C150.

- B. Coarse aggregate shall meet the requirements of Class 6AA aggregate, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.
- C. Intermediate aggregate shall meet the requirements of Class 26A aggregate, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.
- D. Fine aggregate shall meet the requirements of Class 2NS, 2SS, or 2MS aggregate, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.
- E. Reinforcing steel fabric shall meet the requirements of ASTM A1064.
- F. Deformed bars must meet the requirements of ASTM A706, ASTM A615, or ASTM A996 (Type R or Type A only) for Grade 60 steel bars, unless otherwise required. All deformed bars shall be epoxy coated.
- G. Epoxy coated steel reinforcement must be coated in accordance with ASTM A775.
- H. White membrane curing compound shall conform to ASTM C309, Type 2. Curing compound shall be agitated to provide a uniform consistency prior to transfer between containers or before application.
- I. Fiber joint filler shall meet the requirements of ASTM D1751.
- J. Sand for base shall meet the requirements of Granular Material Class II, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.
- K. The detectable warning surface shall contrast visually with adjacent walking surfaces. The Contractor shall submit the detectable warning product information to the Engineer for approval.

2.02 Mixtures

Concrete shall be transit mixed 3,500 psi concrete in accordance with ASTM C94 and Section 01 45 16.01 – Concrete Testing.

Air content, slump, and compressive strength shall be according to Section 01 45 16.01 – Concrete Testing. Concrete shall contain at least six sacks of cement per cubic yard of concrete. Modifications and the use of admixtures may be submitted and shall be approved by the Engineer.

2.03 Submittals

- A. Prior to beginning construction, the Contractor shall submit the name and plant location of the proposed concrete supplier for the project.
- B. Prior to beginning construction, the Contractor shall submit mix designs for the proposed concrete mixtures proposed for use on the project for the Engineer to review.

2.04 Cross Sections

A. Sidewalk

Unless indicated otherwise on the plans, sidewalk shall have a minimum thickness of 4 inches. Sidewalk through residential driveways shall have a minimum thickness of 6 inches. Sidewalk

through commercial driveways shall have a minimum thickness of 8 inches. Sidewalk through driveways shall be reinforced with #10 by 6 inches by 6 inches welded wire fabric.

B. Pavement

Concrete pavement section shall be as indicated on the plans.

C. Concrete Curbs and Concrete Curb and Gutter

Unless shown otherwise on the plans, concrete curb and concrete curb and gutters shall be in accordance with Michigan Department of Transportation Standard Road Plan R-30 Series.

D. Spillways

Unless shown otherwise in the plans, spillways shall be constructed in accordance with Michigan Department of Transportation Standard Plan R-35-series.

PART 3 - EXECUTION

3.01 Coordination of Traffic

Hazardous areas shall be barricaded to protect pedestrian and vehicular traffic.

Work shall be scheduled so that access is maintained to driveways and entrances through the project area to the extent possible. Where a driveway or entrance must be closed for a period, the property owner or occupant shall be notified in advance of the closing.

3.02 Removal of Existing Sidewalk, Curb and Gutter, and Pavement

Where an existing sidewalk, curb and gutter, and/or pavement are to be removed and replaced, the existing structure shall be removed in accordance with Section 02 41 13.13 — Pavement Removal.

3.03 Preparation

The base shall be excavated, filled, and shaped, as required, to construct pavement of the required thickness at the proposed grades and alignment. The base shall be compacted according to Section 01 45 16.02 – Density and Aggregate Testing. Soft and yielding soils shall be excavated and replaced with suitable soils.

Where existing curb and gutter has been removed and prior to constructing new curb and gutter, the Contractor shall install 2 dowels, ¹/₂-inch in diameter, into existing curb and gutter at each end. Cost of dowels are included in the payment for curb and gutter.

Concrete may be placed by slipforming, unless indicated otherwise.

Where forms are used, the forms shall extend the full depth of the concrete. Forms shall be of sufficient strength and staked to prevent springing or yielding after placement of concrete. Flexible forms capable of making a smooth arc shall be used for curved sections. Face forms for the exposed face of curb are not required.

Where steel reinforcement is used, it shall be spliced and held in place in a manner approved by the Engineer. Splices shall be overlapped by 10 inches.

3.04 Required Grades

- A. Sidewalks shall be constructed with a maximum transverse slope of 2 percent. Transverse slopes shall be at least 1 percent, unless longitudinal drainage is provided. The longitudinal slope of sidewalk shall not exceed the general grade established for the adjacent street or highway. Where adjacent street or highway general grades are less than 5 percent, the longitudinal slope of sidewalk may exceed the general road grade to a maximum of 5 percent.
- B. Gutter grades shall not be constructed flatter than 0.4 percent, or less than the grades shown on the plans, whichever is less.

3.05 ADA Requirements

- A. Sidewalks and sidewalk ramps shall meet ADA requirements and shall follow the Michigan Department of Transportation Standard Road Plan R-28-series.
- B. ADA sidewalk ramps shall include polymer, cast in, detectable warning surfaces, red in color. ADA ramps shall be constructed per Michigan Department of Transportation and ADA specifications.
- C. Concrete ramp thickness shall be 6 inches within the first 5 feet behind the back of curb and 4 inches thick beyond the first 5 feet, with a minimum of 4 inches of Michigan Department of Transportation Class II granular material base compacted in place.

3.06 Driveway Openings

Concrete driveway openings shall be constructed in accordance with the Michigan Department of Transportation Standard Road Plan R-29 Series.

3.07 Placement of Concrete

Concrete shall not be placed until the forms (or grade, if the concrete will be slipformed) have been inspected by the Engineer. The Contractor shall notify the Engineer a minimum of 24 hours prior to scheduling a concrete pour.

The base shall be moistened just prior to placement of the concrete.

Concrete shall have a temperature between 45 degrees Fahrenheit and 90 degrees Fahrenheit at the time of placement.

Concrete shall be deposited to the proper depth and spaded or vibrated to ensure proper consolidation. Concrete shall be placed and finished in a continuous operation.

Any material required to fill low spots shall be obtained from the mixture used in the work. Exposed surfaces of the concrete slab shall be finished smooth and even by means of a moistened wood float. Sidewalk and pavement slabs shall be lightly brushed perpendicular to the normal direction of traffic. Water shall not be added to the concrete surface as an aid to finishing. The

top edges of the slab and all transverse joints shall be rounded with a finishing tool having a radius of %1-inch. Surfaces shall not vary more than 3/8-inch from the alignment and typical cross section.

Joints shall be constructed in accordance with the Michigan Department of Transportation Standard Road Plan R-29 and R-30 Series.

Expansion joint filler shall extend the full depth of the concrete, with the top of the filler material just below the finished concrete surface.

Exposed concrete surfaces shall be cured using white membrane curing compound, applied uniformly at a rate of 200 square feet per gallon. Curing compound shall be applied regardless of temperature or humidity conditions.

3.08 Protection

Concrete shall not be placed if the air temperature is not at least 25 degrees Fahrenheit and rising, or more than 90 degrees Fahrenheit. Concrete shall be protected from damage caused by freezing or rain.

The Contractor shall provide protection for existing surfaces (building faces, light poles etc.) from splattering of concrete. Any damage to building faces, light poles, etc. from concrete splatter shall be repaired or replaced at the Contractor's expense.

The Contractor shall provide sufficient barricading and security to protect fresh concrete from accidental damage or vandalism. Damaged concrete shall be removed to a joint and replaced at the Contractor's expense.

3.09 Cleanup

After the concrete has attained sufficient strength, the forms shall be removed.

Where adjacent areas are turf, the area next to the pavement shall be backfilled with sound earth and topsoil, and graded so the surface is about 1-inch below the pavement or as necessary to provide proper drainage.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of constructing concrete curb and gutter, sidewalks, and miscellaneous pavement will be paid for at the contract unit price for the actual quantity of the following pay item(s), which are specifically included on the proposal.

Pay Item	<u>Pay Unit</u>
Sidewalk, Conc, inch	Square Foot
Sidewalk, Conc, Splash Pad	Square Foot
Concrete Curb	Foot

Items not specifically listed on the proposal as pay item(s) are considered to be included in the work of the items which are listed and will not be paid for separately.

4.02 Measurement

Concrete curb, will be measured along the joint of the curbing with the pavement, in units of feet. There will be no deduction in the linear measurement for drainage structures. Openings for driveways (Detail M) will not be included in the linear measurement, but openings for other driveways (Detail L) will be included in the measurement.

Sidewalk will be measured by surface area in units of square feet.

4.03 Work Included

Excavation; grading; filling; replacing unstable soils; furnishing, placing, and compacting a sand base (where required); forming; furnishing and placing reinforcement (where required); placing and finishing concrete; joint construction; form removal; backfilling; protection of uncured concrete; and barricading are all included in the pay items listed.

If concrete becomes damaged by vandalism, accident, or weather, it shall be replaced at the Contractor's expense.

Where curb and gutter replacement is specifically listed as a pay item on the proposal, it includes the work of removing the existing curb and replacing it to a cross section matching the original section, regardless of the type or size. Removal of the existing curb and gutter are included in the work and will not be paid for separately.

SECTION 32 31 13 PVC COATED CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

This work shall include the excavation for and installation of concrete post bases, and the installation of fence framework, fabric, and accessories.

PART 2 - PRODUCTS

2.01 Fence Materials

- A. Acceptable manufacturers and products:
 - Merchants Metals Colorbond I
 - 2. Ameristar PermaCoat PC-40
 - 3. Design Professional approved equivalent
- B. Framework: ASTM F1043 Group I-A and I-C Heavy Industrial Fence and also conform to Federal Specification RR-F-191 Class 1 Grades A and B. Terminal Posts shall be 3-inch SS 40, line posts shall be 2½-inch SS 40 and rails shall be 1⁵/₈-inch SS 40.
- C. Fabric: Federal Specification SRR-F-191, Type I, Hot Dipped Galvanized steel wire; 11-gauge, 2-inch mesh size.
- D. Vinyl Coating shall conform to ASTM F 668 Class 2B. Minimum thickness shall be 0.022 inches for a final finished gauge of 8+/-. Coating color shall be black

2.02 Accessories

- A. Chain link fence accessories: [ASTM F626] Provide items required to complete fence system. Galvanize each ferrous metal item and finish to match framing. All accessories shall be PVC coated to match fabric and framing.
- B. Post caps: PVC-coated formed steel, cast malleable iron, or aluminum alloy weather tight closure cap for tubular posts. Provide one cap for each post. Cap to have provision for barbed wire when necessary. "C" shaped line post without top rail or barbed wire supporting arms do not require post caps. Where top rail is used, provide tops to permit passage of top rail.
- C. Top/bottom rail and brace rail ends: PVC-coated pressed steel per ASTM F626, for connection of rail and brace to terminal posts.
- D. Sleeves: Lengths of top rails to be connected using 6-inch PVC-coated sleeves that allow for expansion or contraction of the rail.
- E. Tie Wire: PVC-coated 9-gauge galvanized steel or 6-gauge aluminum for attachment of chain link fabric to posts and rails. Hog rings attach fabric to tension wire to be12 ½-gauge (0.0985-inch).
- F. Brace and tension (stretcher bar) bands: PVC-coated pressed steel.

- G. Tension (stretcher) bars made of one continuous piece of steel or aluminum, 3/16-inch by 3/4-inch. Provide one bar per end or gate post and two bars per corner or pull post.
- H. Tension wire: PVC applied to metallic coated steel wire: Per ASTM F1664 Class 2a, 6-gauge, (0.1920-inch) diameter core wire with tensile strength of 75,000 psi.
- I. Truss rods and tightener: PVC-coated steel rods with minimum diameter of 5/16-inch. Capable of withstanding a tension of minimum 2,000 pounds.
- J. Nuts and bolts are galvanized but not vinyl coated. Touch up nuts and bolts with PVC touch up paint to match fencing.

2.03 Swing Gates

- A. Gate frames shall be constructed of same material used for fencing.
- B. Provide hinges capable of supporting gate and swinging 180 degrees in or out.
- C. Latch shall be Fulcrum type with pad lock hasp.
- D. Provide drop bar to hold one leaf stationary.
- E. Provide hold opens on all gates.

2.04 Warranty

A. Fencing shall be warranted for a minimum of 15 years against failure due to rust or corrosion.

2.05 Concrete Mix

A. Concrete mix shall have a minimum compressive strength of 3,500 psi and shall conform to the requirements of Grade 35S concrete as outlined in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

PART 3 - EXECUTION

- 3.01 Chain Link Fence Framing Installation
 - A. Install chain link fence in accordance with ASTM F567 and manufacturer's instructions.
 - B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30 degrees or more.
 - C. Space line posts uniformly [at 10-foot on center].
 - D. Set terminal, corner, gate, and line posts per details on plan.
 - E. Check each post for vertical and top alignment and maintain in position during placement and finishing operations.
 - F. Bracing: Install horizontal pipe brace at mid-height for fences 6-foot and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

- G. Top/center/bottom rail: Install lengths, 21-foot. Connect joints with sleeves for rigid connections for expansion/contraction.
- H. Center rails are to be installed when fence fabric is 10-foot or higher, or when shown on drawings.
- I. Bottom rails to be installed when shown on drawings.

3.02 Chain Link Fabric Installation

- A. Fabric: Install fabric on court side and attach so that fabric remains in tension after pulling force is released. Leave approximately ¾-inch between finish grade and bottom selvage. Attach fabric with wire ties to line posts at 15 inches on center and to rails, braces, and tension wire at 24-inch on center.
- B. Tension (stretcher) bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with bands or clips spaced maximum of 15-inch on center.

3.03 Accessories

- A. Tie wires: Bend ends of wire to minimize hazard to persons and clothing.
- B. Fasteners: Install nuts on side of fence opposite fabric side for added security.

3.04 Cleanup and Repair

- A. Repair or replace any damaged finish on the fencing.
- B. Clean up and dispose of any unused materials.

SECTION 32 92 00 TURF ESTABLISHMENT

PART 1 - GENERAL

1.01 Work Included

This work includes soil preparation, seeding, fertilizing, and mulching on those areas designated for turf establishment.

1.02 References

A. Michigan Department of Transportation Qualified Products List

1.03 Related Work

A. Section 31 25 00 – Soil Erosion and Sedimentation Control

1.04 Performance Requirements for Guaranteed Growth and Smooth Ground Surface

The Contractor is responsible to provide turf, substantially free of bare spots and free of weeds. The ground in turf areas shall be smooth, graded to provide positive drainage, and graded to provide a smooth transition to adjacent areas. The Engineer will determine when the requirements of guaranteed growth and smooth ground surface have been met.

Materials, requirements, and methods described in this specification are provided to establish minimum levels. Where the Contractor believes that other materials or methods are appropriate for the specific site conditions or better suited to the Contractor's schedule, the Contractor shall submit details of the alternative materials and/or methods to the Engineer for approval.

The Contractor shall provide re-seeding, watering, and herbicides, as necessary, to achieve the desired results.

There will be no adjustment in project cost for re-seeding, watering, application of herbicides, or using alternative methods of turf establishment.

1.05 Areas Designated for Turf Establishment

All areas disturbed by the Contractor's activities or as a result of the project, which are not to be restored with a pavement or aggregate surface, are to be restored with turf, unless specifically directed otherwise.

Turf shall be established on borrow areas and areas where excess soil is stockpiled.

When shown on the drawings or directed by the Engineer, the Contractor shall establish turf in other areas.

PART 2 - PRODUCTS

2.01 Materials

A. Topsoil

Topsoil shall be a humus-bearing, natural mineral soil of loam, sandy loam, silty loam, or clay loam classification. Topsoil shall neither be excessively acidic or alkaline.

Topsoil shall be screened and free of stones, roots, debris, and other foreign matter. Topsoil which is stripped from the project area shall be removed, transported, and stockpiled in a manner which prevents it from becoming mixed with sub-soils.

B. Fertilizer

Fertilizers shall be standard, commercial packaged or bulk products in granular or liquid form. Each container of packaged fertilizer shall be marked by the manufacturer with the following information: manufacturer name; lot number; date; analysis of contents, including the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash; and the net weight. Bulk fertilizer shall be accompanied with an invoice indicating the manufacturer name; lot number; date; analysis of contents, including the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash; and the net weight or volume.

Fertilizer for seeding and sodding shall be comprised of both a water insoluble component and a water soluble component. The water insoluble nitrogen must be from ureaformaldehydes and/or coarse grade isobutylidene diurea.

Fertilizer shall provide 33 pounds of actual water insoluble nitrogen per acre. The water soluble component of the fertilizer shall provide 65 pounds of actual nitrogen, phosphorus, and potassium nutrient per acre, in equal proportions. The water soluble component of the fertilizer shall include urea, diammonium phosphate, and potassium chloride.

C. Mulch

1. Loose Mulch

Mulch shall be straw or marsh hay, in an air-dried condition. Mulch material must be clean, undamaged, and rot-free. It must be substantially free of weed seed and other objectionable foreign matter.

2. Turf Mulch Blankets

Mulch blankets shall be manufactured by a company currently listed on the Michigan Department of Transportation's Qualified Products List.

Mulch blankets shall have a net covering on both sides of the blanket and shall be manufactured from either excelsior or straw. Excelsior blankets shall be manufactured from a uniform layer of interlocking excelsior fibers cut from sound, green timber, with an average dry weight of 12 ounces per square yard. Straw blankets shall be made of a uniform layer of clean wheat straw, free of weeds and weed seed, with the straw and net covering securely stitched together to form a uniform mat having an average dry weight of 8 ounces per square yard.

3. Mulch Anchoring

Mulching anchoring shall be manufactured by a company currently listed on the Michigan Department of Transportation's Qualified Products List.

Latex-based anchoring shall have a composition, by weight, of 48 percent styrene, 50 percent butadiene, and 2 percent additive, 42 percent to 46 percent solids, and a pH of 8.5 to 10.

Recycled newsprint mulch shall be comprised of specifically prepared, biodegradable, shredded newspaper particles consisting of recycled newsprint fibers. The recycled newsprint must contain a wetting agent, defoaming agent, and nontoxic dyestuff that will impart a bright green or blue color. The dyestuff must adhere tightly to the fiber. Recycled newsprint shall meet the following minimum requirements:

Moisture content (total weight)	12 percent maximum
Shredded high-grade newsprint (oven dry)	96 percent minimum
Tackifier, by weight	1½ percent to 3 percent
Water holding capacity (water per 3½ ounces of fiber)	32 ounces minimum

Wood fiber shall be specially prepared, biodegradable, air-dried virgin wood fibers manufactured from 100 percent whole wood chips. The wood fiber must be manufactured with a tackifier. Recycled materials are not acceptable. The fibers must be dyed with a green or blue biodegradable dye to aid in visual metering during construction. The process and materials must not contain growth or germination inhibiting materials. The wood fiber must conform to the following specifications:

Moisture content (total weight)	12 percent maximum
Organic wood fiber (oven dry)	95 percent minimum
Tackifier, by weight	3 percent to 5 percent
Water holding capacity (water per 3½ ounces of fiber)	35 ounces minimum

Guar gum tackifiers shall contain a minimum of 95 percent guar gum by weight. The remaining components shall be dispersing and crosslinking additives.

Other tackifiers may include water soluble natural vegetable gums, or guar gums blended with gelling and hardening agents, or a water soluble blend of hydrophilic polymers, viscosifiers, sticking aids, and other gums.

D. Weed Control

Herbicides must be approved for use by the Michigan Department of Agriculture and the U.S. Environmental Protection Agency.

2.02 Seeding Mixtures

Seed shall be furnished in durable bags, each with a tag indicating the seed supplier, lot number, date, mixture proportions, purity, germination, and net weight.

Seed mixtures shall meet the requirements of one or more of the following mixtures, or other mixtures that are approved in advance by the Engineer. Where the Contractor believes that another mixture is appropriate for areas within the limit of the project, the Contractor shall request that the Engineer review and approve the substituted mixture(s). Requests for substitutions shall include the name of the seed supplier, the mixture proportions, the purity, and the germination.

	Purity,				Se	ed Mixt	ure		
	Minimum	Germination	Mi	xture F	roport	ions (pe	ercent b	y weig	ght)
Species	(percent)	(percent)	TDS	THV	TUF	TGM	THM	CR	TSM
Kentucky Blue Grass	98	85	5	15	10	10	30		
Perennial Ryegrass	96	85	25	30	20	20	20		50
Hard Fescue	97	85	25		20	30			
Creeping Red Fescue	97	85	45	45	40	40	50		
Fults Salt Grass	98	85		10	10				
Cereal Rye	85	85						100	
Spring Oats	85	85							50

PART 3 - EXECUTION

3.01 Preparation for Turf Establishment

A. Topsoil Stripping

Prior to performing any excavation, filling, grading, or other earthwork, the Contractor shall strip and stockpile topsoil for later use on the project. Excess topsoil shall not be removed from the project site unless specifically provided elsewhere in the contract documents.

B. Finish Grading

The areas that are to be seeded shall be properly graded, sloped, and shaped with an allowance for the thickness of the topsoil layer. The earth bed upon which topsoil will be placed shall be friable to a depth of at least 4 inches. Earth beds not in a friable condition shall be harrowed with a disk, spring tooth drag, or similar equipment.

C. Placement and Preparation of Topsoil

Topsoil shall be spread on the prepared areas to a depth of 3 inches (in place, after rolling or compaction), unless otherwise shown on the plans or proposal. After spreading, any large clods or lumps shall be broken and all stones larger than 1-inch diameter, rocks, roots, litter, and other foreign debris shall be raked up and disposed of by the Contractor. After spreading and raking, the topsoil surface shall be in a friable condition and the surface shall be reasonably close to the proposed grades and cross section.

The topsoil surface shall be shaped to provide proper drainage. Where proposed grades are not shown on the plans, the topsoil surface shall be graded to provide a smooth transition between the new construction and the existing, adjacent ground.

Excess topsoil shall be stockpiled in a location acceptable to the Owner and neatly trimmed to present a neat appearance.

3.02 Turf Establishment

A. Permanent Seeding and Fertilizing

Disturbed areas shall be seeded upon completion of earthwork and grading operations. Disturbed areas shall be stabilized with temporary seeding if permanent seeding cannot be completed.

Seed mixtures for permanent seeding shall be appropriate for the soil type and location, as indicated in the following table. The Contractor may propose and submit alternative mixtures to the Engineer for review and approval. It is the Contractor's responsibility to provide turf areas which are substantially free of bare spots and generally weed-free.

Mixture Designation	Soil Type	Location
TDS	Dry Sandy to Sand Loam	Rural or Urban
THV	Heavy	Rural
TUF	All Types	City Streets
TGM	Medium to Heavy	All
THM	Loamy to Heavy	Residential / Commercial

Fertilizer and seed shall be applied uniformly on areas prepared for seeding. Seed shall be applied at a rate of 220 pounds per acre. Seed and fertilizer may be applied by drilling, broadcasting, or hydraulically. Seed and fertilizer shall be applied before applying mulch. Seed and fertilizer shall be lightly raked or rolled into the prepared topsoil surface.

Neither broadcast seeding nor hydraulic seeding shall be performed during windy weather.

There shall be provisions for mixing or agitating the seed – fertilizer mixture used for hydraulic seeding to keep it evenly distributed in suspension. Mixtures shall be applied within an hour of mixing the seed with water; unused portions shall be discarded.

B. Sodding

Areas to be sodded shall be prepared by grading the area to the desired elevations and contours, less the depth of the topsoil surface and thickness of the sod. Three inches of screened topsoil shall be provided. The topsoil shall be conditioned by harrowing prior to laying the sod. In sloped areas, the harrowing shall be perpendicular to the slope.

The earth bed shall be thoroughly watered just before laying the sod. Sod shall be laid within 24 hours after cutting and shall be properly protected until it is placed. Sod that has been allowed to dry out will not be accepted. Sod shall not be placed on frozen soil, nor shall sod be frozen.

Sod strips shall be placed parallel with the flow of water on slopes and in ditches. The short ends of strips shall be staggered. Strips shall be placed with tight joints. Sod shall be laid starting at the base of the slope and progress upward. The edges of sodded areas shall transition by turning the edges of the sod into the ground and covering the edge with earth (or aggregate if adjacent to a road or pavement) and compacting the covering so that runoff is directed onto the sod. Sod placed adjacent to paved surfaces shall be firmly butted against and level with them.

Sod shall be firmly compacted by tamping it immediately after its placement to provide a surface even, smooth, and free of bumps and depressions. The Contractor shall thoroughly water sod following its placement, and periodically until it has become established.

C. Temporary Seeding

Temporary seeding shall be completed when the permanent seeding cannot be completed because of seasonal conditions. Temporary seeding shall be applied at a rate of 100 pounds per acre, and shall be of the following designation.

Mixture Designation	Soil Type	Location
CR	All Types	Temporary, less than 6 months
TSM	All Types	Temporary, more than 6 months

Before completion of the contract, the Contractor shall complete permanent seeding of all areas which are temporary seeded.

D. Dormant Seeding

Dormant seeding should be used only when necessary to complete a project when seasonal conditions are not conducive to permanent seeding. Dormant seeding shall not be completed on frozen ground. Dormant seeding shall be completed, as required, for permanent seeding.

The Contractor is responsible to establish turf which is substantially free of bare spots and generally free of weeds.

3.03 Mulching

A. Mulch Placement

Immediately after the seed has been set into the topsoil surface by light raking or rolling, the Contractor shall spread mulch and anchor it as appropriate. Mulching shall not be performed during windy conditions.

Loose mulch shall be placed thick enough to shade the ground, conserve moisture, and resist erosion, but open enough to allow sunlight to penetrate and air to circulate.

The Contractor shall maintain mulched areas and repair any areas where damage from erosion, wind, traffic, fire, or other causes occur.

Mulch shall be applied at a uniform rate of 2 tons per acre, except that a rate of 3 tons per acre is required with dormant seeding.

B. Mulch Anchoring

Mulch anchoring (tackifiers) shall be sprayed immediately after the mulch is placed. Spraying shall not be performed when wind might prevent the proper placement of the adhesive. The Contractor shall provide protection measures, as necessary, to protect traffic, signs, structures, and other objects from being marked or disfigured by tackifier materials.

Latex based adhesive shall be mixed at a rate of at least 15 gallons of adhesive with a minimum of 250 pounds of recycled newsprint and 375 gallons of water.

Recycled newsprint shall be mixed at a minimum rate of 750 pounds of newsprint with 1,500 gallons of water.

Wood fiber shall be mixed at a minimum rate of 750 pounds of wood fiber with 1,500 gallons of water.

Guar gum shall be mixed at a minimum rate of 100 pounds of dry adhesive and a minimum of 250 pounds of recycled newsprint and 1,300 gallons of water.

Other tackifiers shall be mixed at a minimum rate of 100 pounds of dry adhesive with a minimum of 250 pounds of recycled newsprint with 1,300 gallons of water.

C. Mulching Netting

When netting is used to secure mulch, it shall be secured with anchors, staples, or pins. The net shall be spread over the mulch so that a worker can walk between adjacent widths of the net. The edges of adjacent widths of net shall be pulled together and held in place with net anchors. Net anchors shall be spaced not more than 30 inches apart along the edges, joints, and centerline. The net shall not be installed in direct contact with the ground. If the Contractor elects to use mulch netting or blankets, the Contractor will be required to remove the netting fabric once the turf is established.

D. Mulch Blankets

Mulch blankets shall be installed within one day of seeding. The side edges of blankets shall be overlapped by 2 inches. Blanket ends shall be shingle lapped 6 inches. Non-metallic staples or pegs shall be placed along all joint edges and along blanket centerlines at a maximum spacing of 2 feet. Blankets in waterways shall be shingle lapped 12 inches on the downslope edge. If the Contractor elects to use mulch netting or blankets, the Contractor will be required to remove the netting fabric once the turf is established.

High velocity blankets shall be installed on slopes of 1:2, or steeper, on ditch bottoms, on ditch side slopes (to an elevation 1 foot above the ditch bottom), and where specifically shown on the drawings or directed by the Engineer.

3.04 Weed Control

Weed control shall be provided by the Contractor, as necessary, to develop turf areas which are relatively free of weeds. Herbicides shall be applied in accordance with federal, state, and local regulations. Herbicides shall be applied in accordance with manufacturer's instructions. Herbicides shall be applied by commercial applicators, licensed in the State of Michigan and certified by the Michigan Department of Agriculture in the appropriate category(ies).

Target weeds shall be sprayed in the newly seeded turf when the new turf grass is sufficiently established to withstand the application of herbicide. Herbicide application shall be repeated if the first application failed to control target weeds.

The Contractor shall take appropriate measures to preserve and protect adjacent property from damages resulting from the application of herbicides. Herbicides shall not be applied when wind may carry it to adjacent areas.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

When Turf Establishment is specifically listed as a pay item on the proposal, payment will be at the contract unit price for the following pay item(s).

Pay Item Pay Unit Turf Establishment Lump Sum

4.02 Measurement

Payment for the work of Turf Establishment will be based on the actual cost for performing the work, as determined by the Engineer.

After bidding, the Contractor shall provide the Engineer with a breakdown of how the Contractor's bid price for Turf Establishment was determined, including the cost for individual tasks such as topsoiling, seeding, fertilizer, mulching, watering, re-seeding, and weed control. An estimated quantity of each task shall be included.

The Engineer will review the Contractor's breakdown to determine its reasonableness for the anticipated work of Turf Establishment. If the Contractor's price for Turf Establishment is believed by the Engineer to be too low for the work required, the Engineer will develop an estimate of the cost of Turf Establishment. If the Engineer's estimate is greater than the Contractor's bid price, additional retainage (from other work completed by the Contractor) will be held to make up the difference. Payment for Turf Establishment will be based on either the contract price or the Engineer's estimate, whichever is greater.

The Contractor will be paid for the work of Turf Establishment proportionally to the progress on completing the work in accordance with the contract requirements, except that at least 25 percent of the cost will be held as retainage until the turf has become established and meets the performance requirements established.

When Sod is called for on the plans or required by the Engineer, payment will be at the contract unit price for the quantity installed, measured by surface area in units of square yards.

4.03 Work Included

The lump sum price will not be adjusted for re-seeding or re-working areas where turf does not become suitably established. The cost of watering, mowing, and weed control (if necessary) is included in the contract price for Turf Establishment and will not be paid for separately.

There will be no adjustment in the price for Turf Establishment based on variations in the area actually established with turf.

The work of Turf Establishment includes furnishing, placing, and preparing a topsoil surface. Where the existing topsoil from the project area is of inadequate quantity or quality to provide the required topsoil surface for Turf Establishment, the cost of furnishing topsoil from offsite is included in the contract price for Turf Establishment and will not be paid for separately.

Temporary seeding required for erosion control or because of seasonal limitations is included in the contract price for Turf Establishment and will not be paid for separately.

END OF SECTION

SECTION 32 92 20 NATIVE SEEDING

PART 1 - GENERAL

1.01 Work Included

This work includes soil preparation, seeding, and maintenance of all areas to receive permanent stabilization with native seed mixes as indicated on the plans.

1.02 References

A. Michigan Department of Transportation Qualified Products List

1.03 Related Work

- A. Section 31 23 01 Excavating, Filling, and Grading
- B. Section 31 25 00 Soil Erosion and Sedimentation Control
- C. Section 32 92 00 Turf Establishment

1.04 Submittals

- A. The Contractor shall submit safety data sheets on the materials specified herein prior to materials being brought on to the site, including:
 - 1. Certification of seed mixture(s) from supplier, stating the botanical and common names of each species, composition by weight of each species; including the year of production and date of packaging.
 - 2. Documentation of Pure Live Seed (PLS) testing from qualified independent testing laboratory for each species.
 - 3. Product data sheets for all herbicides, erosion-control materials, and nuisance species control products used on project.
 - 4. The Contractor shall submit documentation of amended soils, including percentages of amendments by weight and certification indicating that the amendments are free of noxious weed seeds.

1.05 Material Shipping, Handling, and Storage

- A. Seed shall be shipped and stored in the supplier's original packaging until installed.
- B. Seed shall be stored in a manner to protect from moisture, heat, or other conditions that would jeopardize viability or cause germination before installation.
- C. If seed blends are to be provided, seed shall be mixed prior to delivery by the supplier or Contractor.
- D. Deliver seed in original sealed, labeled, and undamaged containers. Submit seed labels to the Engineer.

1.06 Scheduling

- A. Methods of installation will vary according to the time of year.
 - 1. November 1st thru February 28th:
 - a. Seed must be protected from displacement by water and wind erosion.
 - b. Seeding on bare, graded surfaces must be protected with appropriate erosion control blankets on slopes steeper than 5:1, and with blown and crimped straw mulch at 1½ tons per acre on lesser slopes.
 - c. Seed drilled into existing vegetation or on flat ground not subject to erosion may need only minimal erosion protection.

2. March 1st thru June 29th:

- Seeding during this period is appropriate but germination of a portion of the seed may not occur until the following season due to lack of cold stratification to break seed dormancy.
- b. Blown and crimped straw mulch is recommended at 1½ tons per acre on bare soils.
- c. Mulch may not be required if seed is drilled into existing vegetation or flat ground not subject to erosion.
- 3. June 30th thru September 15th:
 - a. Installation of native seed should be suspended unless irrigation can be provided.
 - b. See irrigation guidelines specified herein.
 - c. Annual forbs planted with the mix during this time period may germinate but not have sufficient time to flower before fall senescence.
- 4. September 15th thru October 31st:
 - a. Seeding on graded, bare-soil surfaces must be protected with appropriate erosion control blankets on slopes steeper than 3:1, and with blown and crimped straw mulch at 1½ tons per acre on lesser slopes.
 - b. Seed drilled on flat ground not subject to erosion or into existing vegetation may not require erosion protection.

1.07 Performance Standards

- A. At least 90 percent of the seeded area shall be vegetated with native species or cover crop species from the seed mix by June 1st following seeding (if planting occurred from September 1st through March 30th), or within 60 days of seeding if planted outside this period. Performance shall be verified by means of a walk-through inspection by the Contractor with the Engineer and Owner's representative, rather than by formal sampling.
- B. After one (1) full growing season, at least 50 percent of the native species seeded must be present as live plants, and areal coverage of native species shall be at least 20 percent.

- C. After two (2) full growing seasons, areal coverage of native species shall be at least 60 percent.
- D. There should be no single area of bare ground greater than 900 square feet (30 by 30).

PART 2 - PRODUCTS

2.01 Materials

A. Sources

- 1. Native seed should be obtained from sources within the same EPA Level III Ecoregion as the project site. Some sources can be found at the Washtenaw County Conservation District Web Site: www.washtenawcd.org
- 2. If the desired species are not available from the same Ecoregion, materials shall be obtained from an adjacent region, preferably to the west or east.
- B. Seed supplied to the site shall be tagged with the botanical and common names, bulk weight, PLS weight, and documentation of PLS testing.
- C. Pure Live Seed: Seed quantities shall be provided on a PLS (pure live seed) basis. Bulk quantities used on the project will vary with the actual percent of PLS of the seed lot.
- D. Seed mix(es) shall be provided according to the species list below, proportioned by weight and applied at the specified rates:

1. Lowland Seed Mix

Botanical Name Common Name Permanent Grasses/Sedges:	PLS (Oz/Ac)
Carex vulpinoidea Brown Fox Sedge	3.00
Elymus virginicus Virginia Wild Rye	8.00
Glyceria striata Fowl Manna Grass	3.00
	Total: 14.00
Temporary Cover:	
Hordeum vulgare Winter Barley	100.00
Avena sativa* Oats	160.00
Triticum aestivum* Common Wheat	160.00
	Total: 260.00

^{*}Use Wheat if sown late season (after August 1) or Oats if sown before August 1st.

Forbs:

Apocynum cannabinum Indian Hemp	1.00
Asclepias incarnata Swamp Milkweed	5.00
Aster puniceus Swamp Aster	3.00
Chelone glabra Turtlehead	3.00
Eupatorium perfoliatum Boneset	1.00
Hibiscus moscheutos Rose Mallow	3.00
Lobelia siphilitica Great Blue Lobelia	1.00
Penstemon digitalis Foxglove Beardtongue	1.00
Physostegia virginiana Obedient Plant	2.00
Pycanthemum virginianum Mountain Mint	1.00
Rudbeckia fulgida Black-Eyed Susan	1.00

	Total: 33.00
Zizia aurea Golden Alexanders	3.00
Veronica missurica Ironweed	1.00
Thalictrum dasycarpum Tall Meadow Rue	1.00
Solidago riddellii Riddell's Goldenrod	1.00
Solidago patula Swamp Goldenrod	1.00
Solidago ohioensis Ohio Goldenrod	1.00
Senna hebecarpa Wild Senna	1.00
Scutellaria lateriflora Mad-Dog Skullcap	1.00
Rudbeckia triloba Three-Lobed Coneflower	1.00

2. Prairie Seed Mix

Botanical Name Common Name	PLS (Oz/Acre)
Permanent Grasses/Sedges:	
Carex bicknelii Bicknell's Sedge	3.00
Sporobolus heterolepis Prairie Dropseed	32.00
	Total: 35.00
Temporary Cover:	
Hordeum vulgare Winter Barley	100.00
Avena sativa* Oats	160.00
Triticum aestivum* Common Wheat	160.00
	Total: 260.00

^{*}Use Wheat if sown late season (after August 1) or Oats if sown before August 1st.

3. Rolling Meadow Seed Mix

Botanical Name Common Name	PLS (Oz/Ac)
Permanent Grasses/Sedges:	
Carex sprengelii Sprengel's Sedge	6.00
Carex pensylvanica Pennsylvania Sedge	6.00
Sporobolus heterolepis Prairie Dropseed	32.00
	Total: 44.00
Temporary Cover:	
Hordeum vulgare Winter Barley	100.00
Avena sativa* Oats	160.00
Triticum aestivum* Common Wheat	160.00
	Total: 260.00

^{*}Use Wheat if sown late season (after August 1) or Oats if sown before August 1st.

E. Topsoil

Topsoil shall be a humus-bearing, natural mineral soil of loam, sandy loam, silty loam, or clay loam classification or as defined by plan details. Topsoil shall neither be excessively acidic or alkaline.

Topsoil shall be screened and free of stones, roots, debris, and other foreign matter. Topsoil which is stripped from the project area shall be removed, transported, and stockpiled in a manner which prevents it from becoming mixed with sub-soils.

F. Fertilizer

Fertilizers shall be standard, commercial packaged or bulk products in granular or liquid form. Each container of packaged fertilizer shall be marked by the manufacturer with the following information: manufacturer name; lot number; date; analysis of contents, including the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash; and the net weight. Bulk fertilizer shall be accompanied with an invoice indicating the manufacturer name; lot number; date; analysis of contents, including the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash; and the net weight or volume.

Fertilizer for seeding and sodding shall be comprised of both a water insoluble component and a water-soluble component. The water insoluble nitrogen must be from ureaformaldehydes and/or coarse grade isobutylidene diurea.

Fertilizer shall provide 33 pounds of actual water insoluble nitrogen per acre. The water-soluble component of the fertilizer shall provide 65 pounds of actual nitrogen, phosphorus, and potassium nutrient per acre, in equal proportions. The water-soluble component of the fertilizer shall include urea, diammonium phosphate, and potassium chloride.

G. Erosion Control Materials

1. Erosion-Control Blankets

Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a biodegradable mesh. Include manufacturer's recommended steel wire staples of a length appropriate for site soil conditions.

2. Erosion-Control Fiber Mesh

Biodegradable burlap or spun-coir mesh, a minimum of 0.92 pounds per square yard, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples of a length appropriate for site soil conditions.

3. Blown and Crimped Straw Mulch

Only to be applied to areas with a slope rating of 10H:1 V or less.

PART 3 - EXECUTION

3.01 Preparation

A. Vegetated Sites

- Existing grass and weeds shall be killed with applications of glyshopsatebased herbicide. Sites heavily vegetated with certain species such as fescues (Festuca spp.), reed canary grass (Phalaris arundinacea), or canada thistle (Cirsium arvense) often require two or more applications at two- to three-week intervals to kill resprouts and seedlings from the seed bank.
- Areas of tall or dense vegetation should then be mowed to a height of 6 inches or burned.
 More sparsely vegetated sites can be drill seeded through the existing dead vegetation
 without mowing or burning. Sites containing woody growth may require different
 methods or herbicides for an effective kill.

B. Graded Sites

It is extremely important to avoid soil compaction as much as possible. Equipment access and travel should be routed around all planting areas, and repeat passes over the same area should be limited during all grading, topsoil application, and decompaction work. Equipment having low unit pressure ground contact should be utilized whenever possible.

- C. All planting areas which have been excavated into subsoil should be amended by the following process:
 - 1. Over excavate to 6 inches below the final elevations shown on plans.
 - 2. Check the compaction/density of the subsoil according to the parameters listed below under "Measuring and correcting soil compaction." Decompact if necessary.
 - 3. Apply 2 to 3 inches of topsoil (as specified above under "Acceptable Topsoil").
 - 4. Incorporate the topsoil with the subsoil by ripping, tilling, discing, or other method.
 - 5. Apply and spread evenly enough topsoil to achieve the final grades specified in the plans within a tolerance of ±0.25 feet. After final application of topsoil, measure soil compaction again as specified below and decompact as necessary.
 - 6. After decompaction, the surface should be prepared for seeding by any method which leaves the upper 2 to 3 inches broken down into a fine-particle seedbed with no clods larger than 3-inch diameter. The final graded surface should conform to the elevations shown in the plans to ±0.25 foot.
- D. If crusting from rainfall has occurred, re-scarification is required. Scarification may not be required if drill seeding is to occur.
- E. The seedbed must not be too soft, or seed may become buried too deep. As a test, if adult human footsteps in the seedbed average more than ½ inch deep, the seedbed should be cultipacked or rolled to create a firmer surface.

3.02 Seeding

A. Broadcast Seeding

- 1. Broadcast seeding is preferred over drill seeding on graded, bare soil sites. Apply the seed uniformly over the surface using a combination seeder/cultipacker unit such as a Brillion or Truax Trillion seeder or equivalent.
- 2. A cone seeder or other similar broadcasting equipment may also be used if the seed mix does not contain fluffy seeds in amounts sufficient to prevent free flowing without plugging. Seed should then be pressed into the surface using a cultipacker or roller.
- B. Seeding equipment, whether broadcast or drill, should be calibrated to deliver the seed at the rates and proportions specified in the plans. Equipment should be operated in such a manner as to ensure complete coverage of the entire area to be seeded, and seed must be placed no deeper than ¼ inch in the soil.
- C. No fertilizers or soil conditioners will be required or allowed.

3.03 Erosion Control Materials

- A. Seeding on steep slopes (greater than 5:1 or 3:1 as specified) shall be protected with erosion control blankets.
- B. Seeding on lesser slopes shall be protected with blown and crimped straw mulch at 1.5 tons per acre.
- C. Seed drilled into existing vegetation or on flat ground may not require erosion control protection.

3.04 Cleanup and Protection

- A. Promptly remove soil and debris from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Allow only vehicles and equipment required to perform and maintain work of this section onto completed areas.

3.05 Weed Control

Weed control shall be provided by the Contractor, as necessary, to develop turf areas which are relatively free of weeds. Herbicides shall be applied in accordance with federal, state, and local regulations. Herbicides shall be applied in accordance with manufacturer's instructions. Herbicides shall be applied by commercial applicators, licensed in the State of Michigan and certified by the Michigan Department of Agriculture in the appropriate category(ies).

Target weeds shall be sprayed in the newly seeded turf when the new turf grass is sufficiently established to withstand the application of herbicide. Herbicide application shall be repeated if the first application failed to control target weeds.

The Contractor shall take appropriate measures to preserve and protect adjacent property from damages resulting from the application of herbicides. Herbicides shall not be applied when wind may carry it to adjacent areas.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

When native seeding is specifically listed as a pay item on the proposal, payment will be at the contract unit price for the following pay item(s).

Pay Item Pay Unit Seeding (type) Square Yard

4.02 Measurement

Payment for the work of native seeding will be based on the actual cost for performing the work, as determined by the Engineer.

After bidding, the Contractor shall provide the Engineer with a breakdown of how the Contractor's bid price for Turf Establishment was determined, including the cost for individual tasks such as topsoiling, seeding, fertilizer, mulching, watering, and weed control. An estimated quantity of each task shall be included.

The Engineer will review the Contractor's breakdown to determine its reasonableness for the anticipated work of native seeding. If the Contractor's price for native seeding is believed by the Engineer to be too low for the work required, the Engineer will develop an estimate of the cost of native seeding. If the Engineer's estimate is greater than the Contractor's bid price, additional retainage (from other work completed by the Contractor) will be held to make up the difference. Payment for native seeding will be based on either the contract price or the Engineer's estimate, whichever is greater.

The Contractor will be paid for the work of native seeding proportionally to the progress on completing the work in accordance with the contract requirements, except that at least 25 percent of the cost will be held as retainage until the turf has become established and meets the performance requirements established.

4.03 Work Included

The lump sum price will not be adjusted for re-seeding or re-working areas where turf does not become suitably established. The cost of watering, mowing, and weed control (if necessary) is included in the contract price for native seeding and will not be paid for separately.

There will be no adjustment in the price for native seeding based on variations in the area actually established with turf.

The work of native seeding includes furnishing, placing, and preparing a topsoil surface. Where the existing topsoil from the project area is of inadequate quantity or quality to provide the required topsoil surface for native seeding, the cost of furnishing topsoil from offsite is included in the contract price for native seeding and will not be paid for separately.

Temporary seeding required for erosion control or because of seasonal limitations is included in the contract price for native seeding and will not be paid for separately.

END OF SECTION

SECTION 32 93 00 LANDSCAPING

<u>PART 1 - GENERAL</u>

1.01 Work Included

This work includes excavating planting areas for trees and shrubs, disposing of excess soils, furnishing and planting trees and shrubs of the size and type shown on the plans, backfilling the planting holes with prepared soil, watering and cultivating, and such other work necessary to complete the landscaping as described herein.

This work includes a guarantee of one complete growing season for all planted materials. Where planted materials fail to become established after one complete season, they shall be replaced by the Contractor.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

A. ANSI Z60.1 – Nursery Stock

PART 2 - PRODUCTS

2.01 Materials

A. Nursery Stock

1. Requirements - General

Nursery stock shall be from nurseries located in Zones 4, 5, or 6 of the USDA Hardiness Zone Map.

All stock shall comply with state and federal laws, with respect to inspection for plant diseases and insect infestation, and the Contractor shall maintain the file with the department with all certificates of such inspection.

Any stock which does not conform to these specifications will be rejected and shall be immediately removed by the Contractor.

All nursery stock shall be true to type and name, in accordance with the current edition of *Standardized Plant Names* published by the American Joint Committee on Horticultural Nomenclature. Stock shall be clearly labeled as to species and variety, giving both the common name and scientific names of the plant. The label or tag shall be securely attached to the plant. When age is specified, the label shall also provide such information. The plant shall be of first-class quality, with well-developed branch systems and vigorous, healthy root systems. All stock shall be well-formed and the trunks of trees shall be uniform and straight. They shall be free from insects, disease, and defects. Thin, weak

plants will not be accepted. All stock shall be nursery grown and shall qualify under ANSI Z60.1, except that the size of ball shall not be less than that shown on the plans.

The stock shall come directly from the nursery row. Cold storage plants will not be accepted unless authorized. Substitution shall not be made except with the written permission of the Engineer, and then only when sufficient evidence is shown that the stock called for cannot be secured. Container grown plants shall be used, as called for on the plans or as approved by the Engineer. Such plant material shall meet current ANSI Z60.1.

Inspection of nursery stock will be made at the nursery, by the Engineer, whenever such inspection is deemed advisable. Approval on such inspection shall not be construed as an acceptance of it. Acceptance for planting will not be made until the stock has been delivered and inspected at the planting project site. Inspection will include examination of the root systems of plants. Plants may be examined by removing soil from the root systems of balled or container-grown plants, or digging in the nursery row. Sufficient plant root systems will be inspected for each species and separate plant source to determine the extent and condition of plant root systems. Payment will not be made for plants rendered unsuitable for planting because of the root system inspection. The Contractor shall give the Engineer at least 24 hours' notice before making any delivery of stock, and each shipment shall be accompanied by an invoice showing sizes, species, and varieties included.

Deciduous shade trees shall be straight and symmetrical, with a crown having a persistent main leader. The amount of crown shall be in good overall proportion to the total height of the tree.

Where a clump is specified, it shall have a minimum of two stems originating from a common base at the ground line.

B. Natural Materials

1. Mulching Materials

Shredded Bark: This material shall consist of tree bark which has been stripped and shredded from saw logs by means of a de-barking machine. The material shall be sufficiently fine and free from extraneous material so that it will readily pass through a conventional mulch blower.

2. Prepared Soil

Topsoil shall consist of the dark brown or black loam, clay loam, silt loam, or sandy loam surface of a fertile, friable, humus soil, or mineral origin.

Peat moss shall consist of finely-shredded sphagnum or fibrous peat moss of an approved commercial grade, free from woody substance.

The fertilizer for mixing with peat moss and topsoil shall be a ready-mixed granular material containing equal amounts, by weight, of phosphorus and potassium.

Prepared soil shall consist of a uniform mixture of topsoil, peat moss, and fertilizer. The prepared soil shall be proportioned such that a cubic yard of the prepared soil will contain %-cubic yard of topsoil, %-cubic yard of peat moss, and sufficient chemical fertilizer to provide 1 pound each of available phosphorus and potassium (5 pounds of 0-20-20, 10 pounds of 0-10-10, etc).

Prepared soil shall be produced by thoroughly mixing the component materials prior to final placement.

C. Accessories

1. Wrapping and Balling Materials

Twine for use in tree wrapping shall be composed of a minimum of two-ply jute material. Balling material shall be untreated burlap or other material which will readily decompose. Synthetic materials, such as nylon or plastic, will not be permitted for wrapping or balling.

2. Weed Suppressing Permeable Fabric

Fabric used shall be permeable to air and water. Material shall be black polypropylene with polyester blend. Fabric thickness shall be at least 25 mils.

3. Tree Stakes

Tree stakes shall be 2-inch by 2-inch hardwood. All stakes shall be straight and free of large knots.

PART 3 - EXECUTION

3.01 Preparation

Individual holes shall be centered at the proposed plant locations, dug cylindrical in shape with perpendicular sides and flat bottoms. Unless otherwise specified, the minimum diameters and depths of planting holes shall be large enough to permit placing a minimum of 8 inches of prepared soil below, and 12 inches laterally, beyond the ends of bare roots of root balls. Where special conditions of soil or plant requirements so dictate, planting hole sizes shall be subject to reasonable variation.

If site preparation precedes planting by more than two weeks, the planting holes shall be immediately backfilled with prepared soil.

All plant material shall be clearly labeled as to species and variety. At time of planting, the label or tag shall be securely attached to each plant and shall show the scientific name of the plant. Unless otherwise shown on the plans, all plants shall be balled and burlapped or container grown.

Nursery stock shall be prepared for shipment, in accordance with the requirements of the current ANSI Z60.1, and shall be enclosed or covered during transportation to prevent drying.

In preparation for spring planting, all balling operations shall be completed prior to "bud break". All stock shall be dug and packed with care immediately prior to shipment. Plants shall be dug and transported so as to provide and retain a firm ball of earth. The roots shall be carefully protected with wet straw, moss or other material. The root balls shall be adequately protected from rain or

sudden changes in the weather. Trees or plants will not be accepted if the balls of earth are loosened or broken.

Plants furnished in containers shall have grown in the container for at least one growing season. Plants other than ground covers, over-established in the container as evidenced by "pot bound" root ends, will not be accepted.

Immediately following delivery and inspection at the job, all plants with exposed roots shall be "heeled in" in moist soil. All "heeled in" plants shall be protected and their roots kept moist until planted. The "heeling in" grounds shall be a well-protected, shaded area or a well-ventilated enclosure.

The roots of all planting stock shall be kept moist and adequately protected at all times.

The trunks and branches of all trees shall be carefully protected from injury of any kind during all operations. Any trees that are injured may be rejected.

Planting Beds: Before planting beds are covered with weed control fabric, the beds shall be edged and free of all turf, weeds, dirt clumps, etc. The bed edging lines shall consist of smooth curves, free of kinks, as shown on the plans.

3.02 Planting

Just prior to planting, the earth in the bottom of the holes shall be loosened to a depth of 2 inches, and the earth in the sides shall be loosened to the extent necessary to break the glaze caused by digging.

For plants located on slopes, an earth saucer or berm shall be constructed half way around each plant on the down-slope side. The saucer or berm shall have an inside diameter equal to that of the planting hole, and a maximum height of 6 inches. Soil shall not spill down-slope more than 18 inches.

Plants shall be set plumb. Their depth, after setting, shall be the same as the depth in their original location. The prepared soil shall be carefully puddled and thoroughly firmed at intervals during backfilling, under and around the ball. Care should be exercised to prevent damaging the root ball during the tamping operation. When the plant hole has been backfilled and compacted to one-half depth, the burlap and lacing shall be removed from the upper half of the ball. The backfilling of the hole with prepared soil should then continue to an elevation which, after compaction, is flush with the ground line.

When plants are furnished in containers, the containers shall be removed at the time of planting. Handling methods, which result in a broken or excessively loosened root and soil ball mass, will be sufficient reason for rejection of the plant.

A maximum of root growth shall be preserved and no root pruning will be permitted. Plants shall be set plumb and at a depth equal to the depth in their original location. The exposed roots shall be held firmly in the proper position with the roots spread out. The prepared soil shall be puddled

around the roots and thoroughly firmed at intervals during the process of backfilling. Sufficient water shall be used to ensure thorough saturation of the prepared soil placed in the plant hole.

All new and existing trees shall be provided with a 4-foot diameter spade cut mowing ring. Each mowing ring shall be covered with 1 layer of weed suppressing permeable fabric and then 3 inches of shredded bark mulch.

3.03 Placement of Bed Edging and Weed Control Fabric

Placing both the bed edging and the weed suppressing permeable fabric shall be performed as recommended by the manufacturer. The weed control fabric shall cover 100 percent of exposed earth within the bed lines. All fabric edges shall be "tucked in" and covered by 3 inches of mulch or 4 inches of stone. Edging is not required around individual tree mowing rings.

3.04 Pruning, Watering, Cultivating

All pruning shall be done by workmen experienced in this type of work. Pruning shall be completed prior to planting.

The branches shall be pruned to balance the loss of roots in such manner as to retain the natural form of the plant type. Usually one-third to one-half of the branches shall be removed, but the proportion shall in all cases be subject to the approval of the Engineer. The height ratio of crown to trunk, after pruning, shall be approximately one-third crown to two-thirds trunk. The primary leader shall not normally be cut back. Branches to be removed shall be cut off flush with the trunk or main branch.

Immediately upon completion of the planting work, the Contractor shall clean up the area of surplus materials.

The Contractor shall be responsible to water plants, as necessary, throughout the period of establishment. The intervals between waterings shall be determined by the Contractor, based on their experience and climatic conditions.

At the time of final watering, wrapping material, identification tags, and inspection tags shall be removed and disposed of off the project.

3.05 Period of Establishment

A period of establishment, commencing at the completion of the initial planting and extending through the following complete growing seasons, will be required for all plants. A growing season is defined as the months of June, July, and August.

All plants shall be in a thriving growing condition at the start of the establishment period.

The Engineer will inspect the plants at the end of the first complete growing season to determine any unacceptable plants. Replacement plants shall be planted, as specified in this specification, prior to May 10 of the following spring planting season. This will fulfill the one-year warrantee on the original plantings and no additional warrantee is required for the replacement plants.

PART 4 - MEASUREMENT AND PAYMENT

The work of Landscaping will be paid at the contract unit price for each of the following pay item(s) that are listed on the proposal. General landscaping to include:

<u>Pay Item</u>	<u>Pay Unit</u>
Native Planting-Storm Basin	Lump Sum
Acer Rubrum, 2.5 inch	Each
Betula Nigra, 2.5 inch	Each
Quercus Macrocarpa, 5 inch	Each

The work of preparing for the furnishing and planting the plant or tree, pruning, watering, and cultivating are included in the above pay item(s). The lowland seeding for the storm basin in paid for separately, refer to Section 32 92 20 – Native Seeding.

Payment for trees or plantings will be at the contract unit price for each that is actually planted, except that replacements for those that do not become established will not be eligible for payment.

At the time of completed project, all work included in said contract will be reviewed by the Engineer. Any work deemed not acceptable will be corrected by the Contractor at the Contractors expense.

END OF SECTION

SECTION 33 05 00 ADJUSTING STRUCTURES

PART 1 - GENERAL

1.01 Work Included

This work provides for the vertical adjustment of existing manholes, catch basins, drainage inlets, valve boxes, curb stops, and monument boxes to fit the proposed finish surface. This work includes the temporary lowering of manholes and drainage structures.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ASTM A48 Standard Specification for Gray Iron Castings
- B. ASTM C55 Standard Specification for Concrete Building Brick
- C. ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- D. ASTM C478 Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
- E. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

- A. Section 01 45 16.01 Concrete Testing
- B. Section 01 45 16.02 Density and Aggregate Testing

1.04 Traffic Protection

Vehicular and pedestrian traffic shall be protected from excavations left around structures, structures which have been raised above the level of the adjacent pavement or ground surface, or other hazards by one of the following methods:

- A. Placing and maintaining appropriate barricade(s) at each hazard.
- B. Placing a temporary ramp (HMA on pavement areas, soil or aggregate in non-pavement areas) to provide a smooth transition over the structure.

1.05 Local Standards

All work shall conform to the standards and requirements of the agency(ies) having jurisdiction over the utilities (owning the structures to be adjusted) and the streets or roads (where the utilities are located). Some of the materials or methods described in these specifications may not comply with local standards.

PART 2 - PRODUCTS

2.01 Materials

A. Precast Concrete Grade Rings

Precast grade rings shall be constructed in accordance with ASTM C478. Grade rings shall be of a thickness to provide for adjustment to the required grade.

B. Precast Manhole Sections

Precast manhole sections shall be constructed in accordance with ASTM C478. The diameter, height, thickness, and dimensions shall be as necessary to fit the existing structure and provide for its adjustment to the required elevation.

C. Masonry

Masonry shall be solid concrete bricks or blocks. Bricks shall meet ASTM C55, Grade S-II. Blocks shall be curved, with the inside and outside radii parallel, and of an appropriate diameter for the manhole or drainage structure. Block dimensions shall be chosen to provide the required transition to the existing structure and provide the required adjustment to the final elevation.

D. Castings

Castings for manholes, drainage structures, valve boxes, and monument boxes shall be constructed of gray iron, conforming to ASTM A48, Class 35B. All surfaces of the castings shall be coated with asphaltic paint. The coating shall be smooth, tough, and tenacious when cold, and must not be tacky or brittle.

Lids and frames shall be machined so the lid seats firmly into the frame without rocking.

2.02 Mixtures

A. Mortar

Mortar shall be a mixture of 1 part cement and 3½ parts granular material (MDOT 2NS). A sufficient quantity of water shall be added to attain the consistency necessary for the work.

PART 3 - EXECUTION

3.01 Adjusting Manholes, Catch Basins, and Drainage Inlets

Structures within paved areas shall be adjusted to the final elevation just prior to placement of the final course of HMA (if located within an area of HMA surface) or prior to placement of the concrete (if located within the curb, sidewalk, or driveway).

A. Structure Adjustment in Curb, Sidewalk, or Driveway

Pavement, aggregate, and/or earth around the structure shall be excavated and removed sufficiently for completing the work.

The existing casting of manholes, catch basins, and drainage structures which are to be adjusted shall be carefully removed and protected by the Contractor. Any unsound masonry or concrete in the walls of the manholes, catch basins, and drainage structures shall be

removed. If the elevation of the structure's casting is to be lowered, the wall of the existing structure shall be lowered sufficiently so that when re-installed, the casting will be at the proper elevation.

All materials and debris resulting from the demolition and removal of unsound material shall be kept from falling into the sewer pipes, removed from inside of the manholes or structures, and disposed of properly by the Contractor.

Where casting elevations are to be raised or where structure walls need to be rebuilt to replace unsound material, the structure walls shall be built to the required elevation with an allowance for the height of the casting. The walls may be constructed with concrete masonry or precast concrete grade rings or manhole sections.

Following adjustment of the structure, the excavated area shall be filled with aggregate or HMA and compacted according to Section 01 45 16.02 – Density and Aggregate Testing, or concrete to their respective original levels, or to the elevation of the bottom of the final pavement course.

Following placement of the final pavement course, no part of the casting shall extend above the finished surface; the surface of the pavement shall not be greater than 0.02 feet above the top of the casting.

B. Concrete Masonry

Concrete masonry shall be constructed when temperatures are above freezing, including a cure time of at least 24 hours. The first row of blocks shall be laid on a full bed of mortar on a sound, level course of existing masonry or the concrete base. Blocks shall be laid in level courses with ½-inch joints, except where otherwise approved by the Engineer. Joints shall be finished so that the exposed surface is true and smooth. A ½-inch plaster coat shall be provided over the exterior of the block surface. The blocks shall be wetted and joints raked before applying the plaster coat.

C. Precast Concrete Grade Rings and Manhole Sections

Joints for sanitary sewer manholes shall be rubber O-ring type, meeting the requirements of ASTM C443. Joints for storm manholes, catch basins, and inlets shall be bituminous mastic.

D. Metal Ring Adjuster

Where approved for adjustment of castings, a metal ring of appropriate dimensions may be inserted in the existing frame. The metal ring shall be secured to the existing frame.

3.02 Adjust Valve Boxes and Curb Stops Outside of HMA Pavement

Valve boxes shall be adjusted to the final elevation following the completion of paving operations, other than the final paving course. Valve boxes shall be adjusted just prior to placement of the final course.

Pavement, aggregate, and/or earth around the valve box shall be excavated and removed sufficiently for completing the work.

Existing valve boxes shall be adjusted by sliding or twisting the upper section of the valve box to the required elevation. The valve box shall be securely supported so that the final installation is both plumb and at the required elevation.

Following placement of the final HMA course, no part of the box shall extend above the finished pavement; the surface of the pavement shall not be greater than 0.02 feet above the top of the box.

3.03 Adjust Monitoring Wells

Existing monitoring wells will be adjusted prior to beginning construction. The top casting will be salvaged and re-installed; the riser adjusted to meet flush with finished grade.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of adjusting structures will be paid for at the contract unit price for the following pay item(s), which are specifically included on the proposal.

<u>Pay Item</u>	<u>Pay Unit</u>
Dr Structure Cover, Adj, Case 1	Each
Dr Structure Cover, Adj, Case 2	Each
Monitoring Well, Adj	Each

4.02 Measurement

The work of adjusting drainage structures, valve boxes, curb stops, and monuments will be paid for at the contract unit price for the actual quantity of each which needs to be adjusted for the project, and is adjusted.

The work of furnishing and installing new drainage structure covers for existing structures will be measured in units of each. Only drainage structures which are authorized to be replaced will be included in the measurement.

The work of furnishing and installing new valve boxes and monument boxes for existing structures will be paid for at the contract unit price for the actual quantity of each which is authorized for replacement with a new box. Boxes which must be replaced because of damage which occurred during the Contractor's work will not be included in the measurement for payment.

4.03 Work Included

A. Adjusting Drainage Structures

For the purpose of payment, there will be no distinction between sanitary manholes, storm manholes, water valve manholes, catch basins, drainage inlets, or curb inlets. Any of these will be considered as "drainage structures".

The work of adjusting drainage structures includes removing and salvaging the existing drainage structure casting, removing unsound portions of the existing structure, building the structure wall to the required elevation, and placing the (salvaged) casting. For drainage structures within a pavement area or the curb line, the work of adjusting drainage structures includes removing and replacing the pavement around the structure.

The work of adjusting drainage structures Case 1 includes removing and replacing the pavement around an existing drainage structure, and adjusting the existing structure to the required elevation.

The work of adjusting drainage structures Case 2 outside of pavement areas includes all excavation and backfilling, as needed, to adjust the existing structure to the required elevation.

The work of adjusting drainage structures includes the cost of adjusting the cover up or down, no greater than 6 inches. There will be no adjustment in the price for adjusting drainage structures on the basis of different structures diameters.

The work of placing barricades or constructing temporary ramps over structures, which have been raised when the final grade of adjacent areas has not yet been established, is considered included in the work of adjusting structures and will not be paid for separately.

The work of setting and adjusting castings on new manholes and drainage structures is not considered adjusting drainage structures.

B. Adjusting Monitoring Wells

The work of adjusting monitoring wells includes adjusting the existing cast iron casting to the required elevation.

END OF SECTION

SECTION 33 11 00 WATER MAIN

PART 1 - GENERAL

1.01 Work Included

The Contractor shall install water main and appurtenances in accordance with this specification. This work includes excavation, pipelaying, backfilling, and testing.

The Contractor shall protect existing utilities during construction, whether the existing utilities are shown on the plans or not. Utilities damaged by construction shall be repaired in a manner satisfactory to the Engineer and at the Contractor's expense. The Contractor shall call MISS DIG (800-482-7171) for staking and locating the existing utilities.

The water department will assist the Contractor in locating existing water service leads and mains.

The Contractor shall contact the water department to schedule work that may interfere with existing water service.

The Contractor shall develop a construction sequencing plan and submit to the Engineer and Owner for approval. The construction sequence shall minimize interruption of service.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ANSI A21.4/AWWA C104 American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
- B. ANSI A21.5/AWWA C105 American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
- C. ANSI A21.11/AWWA C111 American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- D. ANSI A21.50/AWWA C150 American National Standard for Thickness Design for Ductile-Iron Pipe
- E. ANSI A21.51/AWWA C151 American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water
- F. ANSI A21.53/AWWA C153 American National Standard for Ductile-Iron Compact Fittings for Water Service
- G. AWWA C110 Ductile-Iron and Gray-Iron Fittings
- H. AWWA C115 Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
- I. AWWA C500 Metal-Seated Gate Valves for Water Supply Service

- J. AWWA C502 Dry-Barrel Fire Hydrants
- K. AWWA C504 Rubber-Seated Butterfly Valves
- L. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service
- M. AWWA C512 Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service
- N. AWWA C515 Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
- O. AWWA C600 Installation of Ductile Iron Water Mains and Their Appurtenances
- P. AWWA C605 Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
- Q. AWWA C651 Disinfecting Water Mains
- R. AWWA C800 Underground Service Line Valves & Fittings
- S. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm), for Water Transmission and Distribution
- T. AWWA C904 Crosslinked Polyethylene (PEX) Pressure Tubing, 1/2 In. (13 mm) Through 3 in. (76 mm) for Water Service
- U. AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks
- V. AWWA C908 Standard for PVC Self-Tapping Saddle Tees for Use on PVC Pipe
- W. AWWA C909 Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 In. (100 mm) and Larger
- X. ASTM B88 Standard Specification for Seamless Copper Water Tube
- Y. ASTM B251 Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube
- ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- AA. ASTM C478 Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
- BB. ASTM D1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
- CC. ASTM D2657 Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
- DD. ASTM D3035 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
- EE. ASTM D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- FF. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

- GG. ASTM F714 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter
- HH. ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
- II. ASTM F2080 Standard Specification for Cold-Expansion Fittings with Metal Compression Sleeves for Crosslinked Polyethylene (PEX) Pipe and SDR9 Polyethylene of Raised Temperature (PE-RT) Pipe
- JJ. ASTM F2657 Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing
- KK. ISO 9002 Model for Quality Assurance in Production, Installation and Servicing
- LL. CSA B137.5 Crosslinked Polyethylene Tubing Systems for Pressure Applications
- MM. DIPRA Polyethylene Encasement Installation Guide
- NN. DIPRA Thrust Restraint Design for Ductile Iron Pipe
- OO. NSF/ANSI Standard 14 Plastics Piping System Components and Related Materials
- PP. NSF/ANSI Standard 61 Drinking Water System Components-Health Affects
- QQ. Plastic Pipe Institute TR-3/2021/HDB/HDS/PDB/SDB/MRS/CRS Policies

1.03 Related Work

- A. Section 01 25 00 Materials and Equipment
- B. Section 01 45 16.02 Density and Aggregate Testing
- C. Section 01 55 26 Maintaining Traffic
- D. Section 01 71 23.16 Construction Staking by Contractor
- E. Section 02 21 14 Color Audio-Video Survey of Construction Areas
- F. Section 02 41 13.13 Pavement Removal
- G. Section 31 10 01 Clearing and Removal of Miscellaneous Structures
- H. Section 31 23 01 Excavating, Filling, and Grading
- I. Section 31 25 00 Soil Erosion and Sedimentation Control
- J. Section 32 11 23 Aggregate Base
- K. Section 32 13 00 Concrete Curb and Gutter, Sidewalk, and Miscellaneous Pavement
- L. Section 32 92 00 Turf Establishment
- M. Section 33 42 00 Culverts

1.04 Submittals

Submit shop drawings or manufacturer's data to the Engineer for review and approval prior to ordering for the following:

- A. Hydrants
- B. Valves
- C. Pipe, including fittings and joints
- D. Restraints
- E. Curb stops, corporation taps, and curb stop boxes
- F. Tracer wire and splice connections
- G. Casing pipe
- H. Manholes, manhole adjusting rings, and castings
- I. Directional Bore

1. Work Plan

Prior to beginning work, the Contractor shall submit to the Engineer a work plan detailing the procedure and schedule to be used to execute the project. The work plan should include a description of all equipment to be used, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), an environmental protection plan, and contingency plans for possible problems. The work plan should be comprehensive, realistic, and based on actual working conditions for this particular project. The work plan should document the thoughtful planning required to successfully complete the project.

2. Equipment

Submit specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the project. Equipment shall include, but not be limited to: drilling rig, mud system, mud motors (if applicable), downhole tools, guidance system, and rig safety systems. Calibration records for guidance equipment shall be included. Specifications for any drilling fluid additives that the Contractor intends to use or might use shall be submitted.

1.05 Quality Assurance and Quality Control

A. Leakage

The completed pipeline shall be subjected to a hydrostatic pressure test in accordance with Section 3.11.

B. Bacteriological

Following disinfection, a bacteriological test shall be completed in accordance with Section 3.11.

1.06 Local Standards

The Owner's standards for materials are shown on the plans. Where there is a conflict between the Owner's standards and the specifications, the Owner's standards prevail.

1.07 Directional Bore Contractor's Qualifications and Experience

All directional boring operations shall be done by a qualified directional boring Contractor, with at least five years of experience involving work of a similar nature to the work required of this project.

Notify the Owner and Engineer a minimum of three days in advance of the start of work.

All work shall be performed in the presence of the Owner or Engineer.

PART 2 - PRODUCTS

2.01 Materials

A. Pipe

Pipe may be any of the following materials, except where a specific material is indicated on the plans or in the proposal.

B. Copper Pipe

Copper pipe shall be constructed of Type K, soft temper copper tubing for underground use, in accordance with ASTM B88 and B251. The manufacturer and pipe type shall be marked on the outside of the pipe. The weight per foot of copper tubing shall meet or exceed that specified by ASTM B251, Table II.

C. Valve Boxes

Valve boxes shall be made of good quality cast iron and shall be of the sectional type. The lower section shall be a minimum of 5 inches in diameter, enlarged at the base to fit around the bonnet of the valve. The upper section shall be arranged to slide or screw down over the adjoining lower section and shall be full diameter throughout. Valve boxes shall be provided with cast iron lids or covers. Lids or covers shall be marked "WATER". The over-all length of valve boxes shall be sufficient to permit the top to be set flush with the final ground surface grade. Valve boxes shall be as manufactured by Traverse City Iron Works, Clow Corporation, or equal.

D. Tracer Wire

Tracer wire shall be designed and manufactured for the purpose of detecting buried utilities. Tracer wire shall be 12 AWG (minimum) copper wire coated with a 30 mil (minimum) polyethylene jacket. The Contractor shall use larger wire, when necessary, for installation without damage during bored installations.

PART 3 - EXECUTION

3.01 Alignment and Grade

The water mains shall be constructed at the alignment and grades indicated in the plans and specifications, except where changes are directed or approved by the Engineer. Fittings, valves, hydrants, and service connections shall be installed at the locations indicated on the drawings or in the specifications, except where field conditions warrant changes which are directed and approved by the Engineer.

Valves and hydrants shall be installed plumb. Valve operating stems shall be installed in a manner to allow for their proper operation.

3.02 Investigation

Prior to excavation, the Contractor shall call MISS DIG and shall contact utility agencies which are not part of the MISS DIG system to make arrangements for identifying the location of existing utilities in the project area. Where potential conflicts are suggested by the plans and/or the utilities' locations, the Contractor shall excavate and expose the existing utilities at least 100 feet in advance of pipelaying operations. Where the existing utilities may conflict with the proposed alignment and construction, the Contractor shall make such appropriate modifications to the alignment and grade, as necessary, to prevent a conflict. Changes to the alignment and grade shall be as directed and approved by the Engineer. Changes to the alignment and grade shall be completed by the Contractor at no additional cost to the project.

3.03 Excavation

The Contractor shall excavate all materials to the depths necessary to construct the water main as shown on the plans. Excavation shall include the removal of rock, dirt, abandoned pipelines, old foundations, stumps and roots, and similar materials encountered. Excavation of whatever material encountered shall be included in the contract unit prices for water main installation and will not be paid for separately.

Excavation shall be in accordance with Section 31 23 01 – Excavating, Filling, and Grading.

3.04 Pipe Handling

Pipe shall be handled in such a manner as to prevent the ends from splitting, damages to the protective coatings, and other undesirable conditions. Pipe shall not be dropped, skidded, or rolled into other pipe. Repairs to damaged pipe must be approved by the Engineer.

3.05 Pipe Cutting

Pipe cutting shall be done in a neat and workmanlike manner, without damage to the pipe or lining, and as to leave a smooth end at right angles to the axis of the pipe. Cutting shall be done by an approved mechanical saw or cutter. Hydraulic squeeze cutters are not acceptable.

3.06 Pipelaying

Pipe located inside structures shall be rigidly supported.

Pipe laid underground shall be uniformly supported through its entire length on a 4-inch cushion of sand. A depression shall be carved out of the sand cushion to accommodate the pipe bells.

Pipe shall be inspected for defects, debris, or dirt while suspended in a sling prior to lowering it into the trench. Defective pipe shall be removed from the project site immediately. Lumps, blisters, and excess coal tar coating shall be removed from inside the bell and outside the spigot. These areas shall be wire-brushed and wiped clean with a dry oil-free rag. No debris, tools, clothing, or other materials shall be allowed in the pipe.

Pipe shall be laid in a dry trench, with bell ends facing in the direction of laying. After placing a length of pipe in the trench, and after installing the gasket and applying the gasket lubricant, the spigot end shall be centered in the bell, and the pipe pushed home and brought to the correct line and grade. The pipe shall be secured in place by tamping sand around it. Precautions shall be taken to prevent soil from entering the joint space.

A watertight plug shall be inserted in the open end(s) of the pipe to prevent water, soil, animals, or other foreign matter from entering the pipe during the construction phase.

When it is necessary to deflect pipe from a straight line, either horizontally or vertically, the deflection shall not exceed the following values:

Nominal Pipe Size (inches)	PVC & PVCO "Push on" Joint Maximum Deflection (inches/18-foot length)	Ductile Iron "Push on" Joint Maximum Deflection (inches/18-foot length)	Ductile Iron Mechanical Joint Maximum Deflection (inches/18-foot length)
4	4	19	27
6	4	19	27
8	4	19	20
10	4	19	20
12	4	19	20
14	0	11	13
16	0	11	13
18	0	11	13
20	0	11	11
24	0	11	9

3.07 Water Services

Water services shall be constructed where shown on the plans or where directed by the Engineer.

Water service pipe shall be connected to the water main through a brass corporation stop.

Water service pipe shall be connected to the water main through a service clamp or saddle (except where direct tapping is permitted) and brass corporation stop. The water main shall be under

pressure during the tapping process. The pipe shall be drilled and tapped to the appropriate size for the connection being installed. The service clamp or saddle shall provide full support around the circumference of the pipe, and have a bearing area of sufficient width along the length of the pipe so that the pipe will not be distorted when the saddle is tightened. U-bolts will not be permitted.

Ductile iron pipe may be direct tapped in accordance with the following tables. Direct taps shall be drilled and tapped under pressure by use of a tapping machine with a combination drill and tap of the appropriate size for the connection being installed.

Minimum DIP Thickness Class Required for Direct Tapping							
Water Main	Tap Size						
Diameter	3/4"	1"	1¼"	1½"	2"		
(inches)							
4	53	55					
6	51	53	55				
8	50	52	53	55			
10	50	51	52	53			
12	50	50	51	52	55		
16	50	50	50	50	54		
20	50	50	50	50	52		
24	50	50	50	50	50		

Minimum Pressure Class of DIP Required for Direct Tapping								
Water Main	Tap Size							
Diameter								
(inches)	3/4"	1"	1¼"	1½"	2"			
4								
6								
8	350							
10	350							
12	350							
16	250	250	250	300	350			
20	250	250	250	250	250			
24	250	250	250	250	250			

PVC and PVCO pipe shall not be direct tapped. Services 2 inches and under shall utilize a service saddle.

The maximum service connection for PVC and PVCO pipe is 2 inches.

After tapping the main and installing the corporation stop, the tap shall be tested by turning the corporation on and off. Any leakage detected visually shall be corrected by the Contractor.

The water service pipe shall be laid such that there is at least 24 inches of slack in the service line at the main. In other words, the first 3 feet of trench adjacent to the main shall have at least 5 feet of service lead pipe laid in it.

All joints of copper pipe shall be flared joints. After the copper pipe is in place and connected to the curb stop, the line shall be visually checked for leaks by closing the curb stop and opening the corporation stop.

The Contractor shall leave the corporation stop in the open position, unless directed otherwise by the Engineer.

The excavation resulting from water service pipe construction or reconnections and within the 1:1 influence of a roadway, driveway, sidewalk, parking lot, railroad, or other structures shall be backfilled by the Contractor with sand and compacted. Excavations not within the 1:1 influence of structures or paved surfaces may be backfilled with suitable native soils and shall be compacted.

Water service pipe shall be buried to the depth shown on the plans for water main depth, unless otherwise directed by the Engineer.

3.08 Conflicts with Existing Utilities

Excavation shall be made sufficiently in advance of pipelaying operations so that water main alignment can be adjusted to go above, below, or around existing pipes, structures, cables, or other obstacles that are encountered. Where such minor adjustments are made to the water main alignment, no additional compensation will be due to the Contractor.

Where existing electric cables, telephone cables, gas mains, or services are damaged, repairs shall be at the Contractor's expense. The repairs shall be made by the appropriate utility.

Where sewer leads are damaged, they shall be repaired by the Contractor at no charge to the Owner. Sewer leads shall be repaired with a section of schedule 40 PVC pipe of the size encountered. Pipe of the same material as that encountered can also be used. The damaged pipe shall be cut square and the "connection" area shall be thoroughly cleaned. Rubber gasketed sleeve couplings, suitable for connecting the pipe sizes and materials encountered, shall be furnished and installed by the Contractor for each reconnection or repair joint.

3.09 Conflicts with Proposed Utilities

This work consists of relocating a portion of existing water main or water service to avoid a conflict with a proposed utility. This work includes furnishing all labor, equipment, and materials required for excavation, installation, disinfection, and backfilling as shown on the plans and specified within this specification.

3.10 Restoration

Areas disturbed by construction activities shall be restored by the Contractor.

3.11 Testing and Disinfection

A. Hydrostatic Pressure Testing for Water Main

Water main shall be hydrostatically tested immediately after the section to be tested is installed. The Contractor shall provide all labor, equipment, and materials to perform the test, including pumps, gauges, plugs, corporations, water, miscellaneous pipes and fittings, and a means of measuring lost water. The testing equipment shall be approved by the Engineer.

The Contractor shall fill the main through hydrants or corporations. After completion of the tests, corporations made for the purpose of testing shall be plugged. Water shall be added to the line and air expelled to provide a pressure of 150 psig. When the Contractor has verified that all air is expelled and that the test pressure is maintained, the Contractor shall notify the Engineer to witness the test. The Engineer shall be given at least a 24-hour notice. The test duration shall be two hours. Water shall be added during the test period, as required, to maintain the required pressure to the highest point in the system throughout the test period. The amount of water required to maintain the test pressure is the actual leakage.

The actual leakage shall not exceed the allowable leakage as tabulated below:

Pipe Size (inch)	Allowable Leakage per 1,000 feet of Water Main (gallons/2 hours)
6	1.00
8	1.32
10	1.66
12	1.98
16	2.64
20	3.32
24	3.98

If unsatisfactory results are obtained, the Contractor shall locate and repair the leak and the system shall be retested.

B. Tracer Wire Continuity

The Contractor shall demonstrate continuity of the installed tracer wire to the Engineer.

C. Disinfection

The Contractor shall flush the water main with potable water until discharge from the main runs clear. The main shall be chlorinated in accordance with AWWA C651. After the chlorination procedure is completed, the water main shall be flushed again until the chlorine content is equal to that of the water being supplied. Sixteen hours or longer after the flushing, the Contractor may begin collecting samples for bacteriological analysis. Samples shall be collected at 24-hour intervals until two consecutive satisfactory results are obtained. Samples shall be collected at the end opposite the chlorine injection, except that in long lines or where contamination is suspected, the Engineer may require other sampling points. Sampling shall be performed under the observation of the Engineer.

Where satisfactory results are not obtained, the main shall be reflushed, redisinfected, and retested. Heavily chlorinated water shall be disposed of properly.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of water main will be paid for at the contract unit price for the actual quantity of the following pay item(s), which are listed on the proposal and are shown on the plans or are authorized by the Engineer. Work not specifically shown as a pay item is considered included in the item(s) which are listed and will not be paid for separately.

Pay Item	<u>Pay Unit</u>
Water Serv, Type K Copper, inch, Tr Det	Foot
Connect to Existing Water Main	Each

4.02 Measurement and Work Included

A. Connect to Existing Water Main

Payment for connection to existing water mains will be measured in units of each, for each connection to an existing main, other than connections made with a cutting-in tee or with a pressure connection. This work includes furnishing and installing all necessary fittings to connect to an existing water main. Excavation to locate and expose the main, protection of existing utilities, disinfection, and backfilling are included and will not be paid for separately. There will be no adjustment in price based upon the size or material of the pipes.

B. Water Serv, ____, ___ inch

Payment for water services will be at the contract unit price for the actual length of copper pipe constructed. The length will be measured along the pipe, including the length of the extra 2-foot loop. The laying length of fittings will be included in the measurement; fittings will not be paid for separately. The measurement will begin at the center of the water main.

Payment for water services will be based on the contract price for Tr Det G, when the pipe is within the influence of a pavement or other structure. The work of disposing of unsuitable excavated material and replacement with sand is included with the item of Tr Det G. Water services not within the influence of pavements or structures are considered Tr Det F.

When water services are shown on the plans to be installed by boring, payment will be at the contract unit price for the length of service pipe installed by boring, up to the length shown on the plans or otherwise authorized by the Engineer. Payment for water services installed by boring includes the cost of excavating and backfilling boring pits.

Bored installations that are not successfully completed or are not accepted by the Owner are not eligible for payment.

END OF SECTION

SECTION 33 31 00 SANITARY SEWER

PART 1 - GENERAL

1.01 Work Included

The Contractor shall supply all labor, material, and equipment required for the installation and testing of gravity sanitary sewers and appurtenances in compliance with these general specifications, project specifications, and the contract drawings. The proposed pump station will follow details and notes indicated on the plans.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. ASTM A48 Standard Specification for Gray Iron Castings
- B. ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- C. ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- D. ASTM C478 Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
- E. ASTM C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- F. ASTM C1479 Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations
- G. ASTM D1785 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- H. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- I. ASTM D2665 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- J. ASTM D2680 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
- K. ASTM D3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- L. ASTM D3139 Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

- M. ASTM D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- N. ASTM D4101 Standard Specification for Polypropylene Injection and Extrusion Materials
- O. ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- P. ASTM F1417 Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
- Q. ASTM F1668 Standard Guide for Construction Procedures for Buried Plastic Pipe
- R. ANSI A21.4/AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
- S. ANSI A21.5/AWWA C105 Polyethylene Encasement for Ductile-Iron Pipe Systems
- T. ANSI A21.10/AWWA C110 Ductile-Iron and Gray-Iron Fittings
- U. ANSI A21.11/AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- V. ANSI A21.51/AWWA C151 Ductile-Iron Pipe, Centrifugally Cast
- W. ANSI A21.53/AWWA C153 Ductile-Iron Compact Fittings
- X. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

- A. Section 01 25 00 Materials and Equipment
- B. Section 01 45 16.02 Density and Aggregate Testing
- C. Section 01 55 26 Maintaining Traffic
- D. Section 01 71 23.16 Construction Staking by Contractor
- E. Section 02 21 14 Color Audio-Video Survey of Construction Areas
- F. Section 31 10 01 Clearing and Removal of Miscellaneous Structures
- G. Section 31 23 01 Excavating, Filling, and Grading
- H. Section 31 25 00 Soil Erosion and Sedimentation Control
- I. Section 32 92 00 Turf Establishment

1.04 Submittals

The Contractor shall submit shop drawings or certificates of compliance to the Owner and Engineer for the following items.

- A. Pipe, fittings, and joint material
- B. Manholes and manhole adjusting rings and castings
- C. Pipe bedding and backfill material

1.05 Quality Assurance and Quality Control

A. Grade and Alignment

Grade and alignment shall be maintained using a laser. The Contractor shall verify that the sewer is constructed at the proper alignment by checking grades and offsets at each manhole, at 50 feet upstream from manholes, and at 100-foot intervals. The Contractor shall report asconstructed measurements to the Engineer.

B. Acceptance Tests

The completed sewer(s) shall be subjected to the following tests, prior to acceptance by the Owner. Acceptance tests shall be completed by the Contractor, in the presence of the Engineer (or Owner's representative).

1. Air Test

Air testing shall be completed in accordance with section 3.08.A.

2. Deflection Testing

All plastic sewers shall be subjected to a deflection test in accordance with Section 3.08.B.

3. Physical Inspection

The physical inspection shall be completed in accordance with Section 3.08.C.

PART 2 - PRODUCTS

2.01 Materials

All material supplied shall be new and shall be designed and guaranteed to perform the service required.

A. Pipe

Pipe shall be of the material, class and/or thickness indicated on the plans or on the proposal. If no specific materials or classes are provided on the plans or on the proposal, any of the following pipe materials are permissible.

1. PVC Pipe

All 3-inch diameter thru 15-inch diameter PVC pipe shall be ASTM D3034 gasketed sewer pipe with an SDR of 26 or lower. All PVC pipe with a diameter larger than 15-inch shall meet ASTM F679 with a pipe stiffness (PS) of 115. Pipe joints shall conform to ASTM D3212. Gaskets shall conform to ASTM F477 . PVC pipe conforming to ASTM D1785 Schedule 40 and ASTM D2665 is acceptable for 6-inch service leads.

2.02 Material Testing

All materials to be incorporated in the construction of gravity sewers and appurtenances shall be subject to inspection and tests, as specified by ASTM or AWWA references. The Owner reserves the right to subject any material supplied for a particular project to an independent testing laboratory. Such tests, if scheduled, shall be paid for by the Owner. The results of such tests shall be the basis of material acceptance.

The Contractor shall supply the Owner with shop drawings, a certificate of compliance, or actual test results stating that the material to be used is in conformance with the specifications prior to using material for construction.

PART 3 - EXECUTION

3.01 General

Sewers shall be constructed in accordance with the following standards, except as modified in this specification:

A. Plastic Pipe: ASTM D2321 and ASTM F1668

3.02 Excavation

Excavation shall be completed in accordance with Section 31 23 01 – Excavating, Filling, and Grading.

3.03 Pipe Alignment

It shall be the Contractor's responsibility to transfer the line and grade to the bottom of the excavation for pipe laying. Lasers shall be used for pipe laying.

It shall be the Contractor's responsibility to protect the original survey control and benchmarks, as set by the Engineer.

3.04 Pipe Laying

Each pipe shall be laid on an even, firm bed, so that no uneven strain will come to any part of the pipe. Particular care shall be exercised to prevent the pipes bearing on the sockets. Bell holes for bell and spigot pipe shall be dug at each point as specified before. Each pipe shall be laid in the presence of the inspector. The bell-end of the pipe shall be laid up-grade. Pipe laying shall proceed in the upstream direction, except where otherwise approved by the Engineer.

The interior of the sewer shall be cleaned of all dirt, debris, jointing material, and other material.

All pipe shall be completely pushed to the "home" position.

Pipes laid in tunnel or casing pipe shall be supported on suitable blocks, cut or grouted into position to place the invert of the sewer or drain at the slope, and to the elevations indicated on the contract drawings.

3.05 Pipe Joints

In all jointing operations, the trench must be dewatered when joints are made. Bell and spigot or tongue and groove ends of the pipe shall first be wiped clean before actual jointing operations are started.

Joints between consecutive bell and spigot or tongue and groove pipe shall be made with a rubber gasket. The gasket shall be fitted over the tongue or spigot of each pipe, as recommended by the manufacturer, and the pipe entered into the bell or groove and shoved home.

A. PVC Joints

All PVC pipe shall be joined with rubber compression gaskets that are factory installed. The joint shall be lubricated and joined so the "home" mark on the pipe is flush with the bell end.

3.06 Connections for Service Pipes

Service connections for house sewers shall be provided in the main sewers, as shown on the contract drawings or as designated in the specifications. The exact location shall be as directed by the Engineer during construction.

Either tee or wye branches are acceptable for service connections, where the main line sanitary sewer is 12 inches or greater. Wye fittings are required on 8-inch and 10-inch sewers.

For service connections where the main line is less than 10 feet deep, the Contractor need not supply a riser connection for the service lead. The service connection shall be left at a depth of 8 feet to 10 feet below the ground at the property line. The Contractor has the option of installing the lead at an incline or using a riser section for sewers less than 10 feet deep.

When the invert of the sanitary sewer is in excess of 10 feet, a riser section shall be used to raise the service connection to a point approximately 10 feet below the surface of the ground. All service connections shall be installed in accordance with the standard details.

All openings shall be plugged with air tight stoppers.

3.07 Backfill

Backfill shall meet the requirements of Section 31 23 01 – Excavating, Filling, and Grading.

3.08 Acceptance Tests - Sanitary Sewers

The methods of testing shall be approved by the Engineer. The Contractor shall provide the necessary equipment and labor for making the tests, and the cost of testing and repair shall be included in the unit price bid for completed sanitary sewer. The Engineer shall determine when grouting or relaying of faulty pipe is required.

A. Air Testing

Sewers less than 24 inches in diameter shall be subjected to an air test. The Contractor shall furnish all necessary labor, equipment, and supervision to perform the required air testing. The testing of PVC pipe sewer shall conform to ASTM F1417.

The Contractor shall be required to furnish the Owner with acceptable air test results for each segment of sanitary sewer. All testing shall be monitored by the Engineer.

The procedure for air testing of sewers shall be as follows:

The sewer line shall be tested in increments between manholes. The line shall be cleaned and plugged at each manhole. Such plugs shall be designed to hold against the test pressure and shall provide an air-tight seal. One of the plugs shall have an orifice through which air can be introduced into the sewer. An air supply line shall be connected to the orifice. The air supply line shall be fitted with suitable control valves and a pressure gauge for continually measuring the air pressure in the sewer. The pressure gauge shall have a minimum diameter of 3½ inches and a range of 0-10 psig. The gauge shall have minimum divisions of 0.10 psig and an accuracy of plus or minus 0.04 psig.

The sewer shall be pressurized to 4 psig, plus sufficient pressure to equal the force exerted by ground water over the pipeline. At least 2 minutes shall be allowed for the air pressure to stabilize between 3.5 and 4 psig. If necessary, air shall be added to the sewer to maintain a pressure of 3.5 psig or greater.

After the stabilization period, the air supply control valve shall be closed so that no more air will enter the sewer. The sewer air pressure shall be noted and timing for the test begun. The test shall not begin if the air pressure is less than 3.5 psig, or such other pressure as is necessary to compensate for ground water level.

The time required for the air pressure to decrease 1 psig during the test shall not be less than the time shown in the following table:

Pipe Diameter (inches)	Minimum Test Time (minutes)	Pipe Length for Minimum Time (feet)	Time for Longer Pipe Length (seconds)
4	3:46	597	0.380 L
6	5:40	398	0.854 L
8	7:34	298	1.520 L
10	9:26	239	2.374 L
12	11:20	199	3.418 L
15	14:10	159	5.342 L
18	17:00	133	7.692 L
21	19:50	114	10.470 L

Length is based on the length of the sewer main only. If laterals or other leads are connected, their lengths are not to be included in the testing length.

If a sewer fails to pass any of the previously described tests, the Contractor shall determine the location of the leaks, repair them, and retest the sewer. The tests shall be repeated until satisfactory results are obtained.

B. Deflection Testing

All sanitary sewers constructed using plastic pipe shall be subjected to a deflection test. The Contractor shall furnish all labor, materials, and equipment necessary to perform deflection testing. The testing shall be completed after the pipeline has been backfilled for a period of at least 30 days. The pipeline shall be tested with a rigid ball or mandrel having at least 7 points, and having a diameter of not less than 95 percent of the average inside diameter of

the pipe being tested. The average diameter for the pipe will be as specified by the ASTM specification for the pipe material, class, and size. Where testing indicates that the pipe deflection exceeds 5 percent of the pipe diameter, the pipe shall be removed and replaced. Pipe that is replaced shall be re-tested at least 30 days following its replacement.

Deflection testing shall be performed in the presence of the Engineer. The Contractor shall provide the Engineer with a least two working days' notice of conducting deflection testing.

C. Physical Inspection

Upon completion of all work, the Contractor shall open all manholes in the presence of the Engineer to demonstrate that the manholes are complete and free of debris.

3.09 Bypass Pumping

Bypassing of the existing sewage shall be provided, as required, to maintain uninterrupted sanitary sewer service. The line shall be plugged at an upstream manhole and the flow shall be pumped to a downstream point or adjacent system. The pump and bypass lines provided shall be of sufficient size to handle the normal and peak flow conditions for the system. Internal combustion engines shall have adequate exhaust silencers to muffle engine noise to an acceptable level for the area where located.

The bypass plan for each segment of pipe shall be submitted to the Owner and Engineer for review and approval prior to the start of the project, along with a list of equipment. All property owners affected by the bypass shall be notified by the Contractor a minimum of 48 hours in advance.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of constructing sanitary sewers will be paid for at the contract unit price for the following pay item(s), which are included on the proposal. Work not specifically listed as a pay item on the proposal is included in the pay item(s) listed and will not be paid for separately.

<u>Pay Item</u>	<u>Pay Unit</u>
Sanitary Sewer Tap, inch	Each
Sanitary Sewer Lead, inch, Tr Det	Foot
Grinder Pump Station	Lump Sum

4.02 Measurement and Work Included

A. Sanitary Sewer Tap, __ inch

Pipe connections and proposed manhole connections to existing sewer pipes will be paid at the contract unit price for Sanitary Sewer Tap, __ inch when included as a pay item on the proposal. Sanitary sewer taps will be measured in units of each, based on the size of the existing pipe for proposed manhole connections and based on the inlet pipe size for proposed pipe connections, with no adjustment made for differing construction materials. The work of cutting the existing pipe or coring a hole are included in the work and will not be paid for separately.

B. Sanitary Sewer Lead

Payment for PVC sewer leads will be at the contract unit price for the actual length constructed. The length will be measured along the pipe, including the length of the riser. The laying length of fittings will be included in the measurement; fittings will not be paid for separately. The measurement will begin at the center of the mainline sewer.

Payment for sewer leads will be based on the contract price for Trench Detail B, when the sewer is within the influence of pavement or structures. The work of disposing of unsuitable excavated material and replacement with sand is included with the item of Trench Detail B. Sewer leads not within the influence of pavement or structures is considered Trench Detail A and can be backfilled with native material, as approved by the Engineer.

When sewer leads are shown on the plans to be installed by boring and jacking, payment will be at the contract unit price for the length of sewer lead installed by boring and jacking, up to the length shown on the plans or otherwise authorized by the Engineer. Payment for sewer lead installed by boring and jacking includes furnishing and installing both the casing pipe and the carrier pipe. The cost of excavating and backfilling boring pits is included in the work and will not be paid for separately.

C. Bypass Pumping

Bypass pumping will be paid for as a separate pay item, when it has been included as a pay item on the proposal. Otherwise, bypass pumping is considered to be included in the work of sanitary sewer construction and will not be paid for separately. The work of bypass pumping of existing sewage shall include all labor, materials, equipment, and all other items required to complete this work.

D. Grinder Pump Station

All items associated with the purchase, delivery, excavation, and installation of the grinder pump station and associated force main, including start up review with owner and provision of operations and maintenance manual will be included in this item.

END OF SECTION

SECTION 33 42 00 CULVERTS

PART 1 - GENERAL

1.01 Work Included

This work includes constructing new culverts of the size and type shown on the plans. Excavation, laying and jointing the pipe, and backfilling are included.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. AASHTO M36 Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
- B. AASHTO M170 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- C. AASHTO M196 Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
- D. AASHTO M245 Standard Specification for Corrugated Steel Pipe, Polymer-Precoated, for Sewers and Drains
- E. AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 300-mm to 1,500-mm (12-in. to 60-in.) Diameter
- F. AASHTO M304 Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
- G. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

A. Section 01 45 16.02 – Density and Aggregate Testing

1.04 Submittals

The Contractor shall submit drawings and manufacturer's specifications for the following materials.

- A. Pipe culverts
- B. Jointing
- C. End sections

1.05 Quality Assurance and Quality Control

A. Deflection Testing

Plastic pipe culverts shall be tested for deflection between five and ten days before placement of the pavement or final surface. The Contractor shall provide a 9-point mandrel with an effective diameter of 95 percent of the inside pipe diameter. The Contractor shall demonstrate that the pipe deflection resulting from the completed installation does not reduce the pipe diameter by more than 5 percent.

1.06 Notifications

The Contractor shall notify MISS DIG (800-482-7171) at least three work days before excavation.

When replacing existing driveway culverts, the Contractor shall notify the affected property owner/resident in advance of beginning replacement.

PART 2 - PRODUCTS

2.01 Pipe

Culverts shall be of the size(s) shown on the plans. Unless a specific type, class or thickness is called for on the plans or in the proposal, material class shall meet the requirements of Pipe Alternates for Culvert Classes, as described in Section 401 of the Michigan Department of Transportation 2020 Standard Specifications for Construction.

A. Corrugated Metal Pipe

1. Corrugated Galvanized Steel Pipe

Corrugated galvanized steel pipe with circular cross section and reformed corrugated galvanized steel pipe with pipe arch shape shall conform to the requirements of AASHTO M36. The Contractor shall furnish the Owner with two copies of a certification of compliance with the chemical requirements of the base metal, as specified in AASHTO M36.

Corrugated metal pipe culverts shall be provided in accordance with the following tables, unless a particular gauge or wall thickness is specifically called for on the plans or on the proposal.

Wall Thickness Requirements in Inches, Based on Diameter Class of Pipe and Size of Corrugation for Driveway Culverts and Downspouts

		Depth of Cover						
	0-16	0-16 feet >16-24 feet			>24	1-32 feet	t	
Pipe			Corrug	ation Si	ze (inch)			
Diameter	$2^2/_3x^1/_2$	3x1, 5x1	$2^2/_3x^1/_2$	3x1	5x1	$2^2/_3x^1/_2$	3x1	5x1
(inch)			Required \	Wall Thi	ckness (i	nch)		
12-30	0.064	-	0.064	-	-	0.064	-	-
36-48	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
54	0.079	0.064	0.079	0.064	0.064	0.079	0.064	0.064
60	0.109	0.064	0.109	0.064	0.064	0.109	0.064	0.064
66	0.138	0.064	0.138	0.064	0.064	0.138	0.064	0.064
72	0.138	0.064	0.138	0.064	0.064	0.138	0.064	0.064
78	0.168	0.064	0.168	0.064	0.064	0.168	0.064	0.064
84	0.168	0.064	0.168	0.064	0.064	0.168	0.064	0.079
90	1	0.064	-	0.064	0.064	-	0.079	0.079
96	-	0.079	-	0.079	0.079	-	0.079	0.079
102	-	0.079	-	0.079	0.079	-	0.079	0.109
108-120	-	0.109	-	0.109	0.109	-	0.109	0.109
126	-	0.138	-	0.138	0.138	-	0.138	0.138
130-136	-	0.138	-	0.138	0.138	-	0.138	0.138
144	-	0.168	-	0.168	0.168	-	0.168	0.168

Wall Thickness Requirements in Inches,
Based on Class of Pipe and Size of Corrugation for Road Culverts

	Class A and Class B Class C			Class A and Class B Class C Class D			
Pipe	Class A un	Corrugation Size (inch)					
Diameter	$2^2/_3 \times ^1/_2$	3x1, 5x1	$2^2/_3 \times ^1/_2$	3x1, 5x1	$2^2/_3 \times ^1/_2$	3 x 1	5 x 1
(inch)		ı	Required Wa	all Thicknes	s (inch)		
12-30	0.109	-	0.109	1	0.109	-	-
36-60	0.109	0.109	0.109	0.109	0.107	0.109	0.109
66-72	0.138	0.109	0.138	0.109	0.138	0.109	0.109
78-84	0.168	0.109	0.168	0.109	0.168	0.109	0.109
90-102	1	0.109	-	0.109	1	0.109	0.109
108-120	-	0.109	-	0.109	-	0.109	0.109
126	-	0.138	-	0.138	-	0.138	0.138
130-136	-	0.138	-	0.138	-	0.138	0.138
144	-	0.168	-	0.168	-	0.168	0.168

Gauge Equivalents to Nominal Thickness

Sheet Gauge	Nominal Thickness				
Number	Galvanized	Aluminum Alloy			
18	0.052	0.048			
16	0.064	0.060			
14	0.079	0.075			
12	0.109	0.105			
10	0.138	0.135			
8	0.168	0.164			
7	0.188	-			
5	0.218	-			
3	0.249	-			
1	.0280	-			

For pipe arch shapes, minimum thickness shall be based on the next larger size if the actual span dimension is not listed.

The ends of helical corrugated pipes shall be re-rolled to form at least two circumferential corrugations, or to form an upturned flange in accordance with AASHTO M36 or AASHTO M245.

2. Corrugated Aluminum Alloy Pipe

Corrugated aluminum alloy pipe shall meet the requirements of AASHTO M196, except that pipe must be fabricated from aluminum sheet having the nominal thickness specified below for the size of culvert furnished.

Wall Thickness Requirements in Inches, Based on Diameter Class of Pipe and Size of Corrugation for Driveway Culverts and Downspouts

		Depth of Cover						
	0-16	0-16 feet >16-24 feet			>24	1-32 feet	t	
Pipe			Corrug	ation Si	ze (inch)			
Diameter	$2^2/_3x^1/_2$	3x1, 5x1	$2^2/_3x^1/_2$	3x1	5x1	$2^2/_3x^1/_2$	3x1	5x1
(inch)			Required \	Wall Thi	ckness (i	nch)		
12-30	0.064	-	0.064	-	-	0.064	-	-
36-48	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
54	0.079	0.064	0.079	0.064	0.064	0.079	0.064	0.064
60	0.109	0.064	0.109	0.064	0.064	0.109	0.064	0.064
66	0.138	0.064	0.138	0.064	0.064	0.138	0.064	0.064
72	0.138	0.064	0.138	0.064	0.064	0.138	0.064	0.064
78	0.168	0.064	0.168	0.064	0.064	0.168	0.064	0.064
84	0.168	0.064	0.168	0.064	0.064	0.168	0.064	0.079
90	1	0.064	-	0.064	0.064	-	0.079	0.079
96	-	0.079	-	0.079	0.079	-	0.079	0.079
102	-	0.079	-	0.079	0.079	-	0.079	0.109
108-120	-	0.109	-	0.109	0.109	-	0.109	0.109
126	-	0.138	-	0.138	0.138	-	0.138	0.138
130-136	-	0.138	-	0.138	0.138	-	0.138	0.138
144	-	0.168	-	0.168	0.168	-	0.168	0.168

Wall Thickness Requirements in Inches,
Based on Class of Pipe and Size of Corrugation for Road Culverts

	Class A an	d Class B		Class C			Class D	
			Coi	rrugation S	ize (inch)			
Pipe Diameter	$2^2/_3 \times ^1/_2$	3x1, 5x1	$2^2/_3 \times ^1/_2$	3x1	5x1	$2^2/_3 \times ^1/_2$	3 x 1	5 x 1
(inch)			Require	ed Wall Thi	ckness (inc	h)		
12-30	0.079	-	0.079	-	1	0.079	1	-
36-54	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.079
60	0.109	0.079	0.109	0.079	0.079	0.109	0.079	0.079
66-72	0.138	0.079	0.138	0.079	0.079	0.138	0.079	0.079
78-84	0.168	0.079	0.168	0.079	0.079	0.168	0.079	0.079
90-96	-	0.079	-	0.079	0.079	-	0.079	0.079
102	-	0.079	-	0.079	0.079	-	0.079	0.109
108-120	1	0.109	ı	0.109	0.109	-	0.109	0.109
126	-	0.138	-	0.138	0.138	-	0.138	0.138
130-136	-	0.138	-	0.138	0.138	-	0.138	0.138
144	-	0.168	-	0.168	0.168	-	0.168	0.168

Gauge Equivalents to Nominal Thickness

Sheet Gauge	Nominal Thickness				
Number	Galvanized	Aluminum Alloy			
18	0.052	0.048			
16	0.064	0.060			
14	0.079	0.075			
12	0.109	0.105			
10	0.138	0.135			
8	0.168	0.164			
7	0.188	-			
5	0.218	-			
3	0.249	-			
1	.0280	-			

3. Coupling Bands

The coupling bands for connecting sections of pipe and for attaching end sections to culvert pipe must be circumferentially corrugated with the same size corrugations as on the ends of the pipe being joined, or must be pre-formed channel bands for use on pipe ends with flanges. Coupling bands and coupling band connections shall meet the requirements of AASHTO M36 and M245.

4. Metal End Sections

Culvert end sections shall be flared and beveled to conform with ditch slopes.

Metal end sections shall conform with AASHTO M36, where applicable. The metallic coating on the end sections shall be the same as on the pipe, except that zinc coated steel end sections may be used with aluminum coated steel pipe. End sections shall be furnished complete with coupling bands, or hardware necessary for connecting them to the end of the pipe culvert.

B. Concrete Pipe Culverts

1. Reinforced Concrete Pipe

Concrete pipe culverts shall be constructed of reinforced concrete pipe meeting the requirements of AASHTO M170. Pipe class shall be as follows:

Cover Over Top of Culvert (feet)	Class (AASHTO M170)
1 Foot to 3 Feet	IV
3 Feet to 10 Feet	II
10 Feet to 16 Feet	III
16 Feet to 23 Feet	IV
23 Feet to 33 Feet	V
Driveways	II

2. Concrete End Sections

Concrete end sections shall be precast meeting the requirements of AASHTO M170, Class II. End sections shall connect to concrete pipe culverts with tongue and groove joints.

Joint Sealer

Joints shall be mastic type.

C. Plastic Pipe Culverts

1. Smooth Lined Corrugated Polyethylene Pipe (SLCPP)

Pipe and fittings shall meet the requirements of AASHTO M294, Type S.

2. Corrugated Polyvinyl Chloride Pipe (CPV)

Pipe and fittings shall meet the requirements of AASHTO 304.

3. Corrugated Plastic Pipe Couplings

If a separate coupling is used to join two pipes together, it shall be a solid wall one-piece sleeve fabricated from either polyethylene (PE) or polyvinyl chloride (PVC), with a rubber gasket on both ends.

2.02 Aggregate

A. Sand

Sand shall meet the requirements of Granular Material III, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

PART 3 - EXECUTION

3.01 Removing Culverts

Where existing culverts are to be removed, the Contractor shall carefully remove the pipe and any end sections or appurtenances. Where the culverts are to be salvaged or re-used, the Contractor shall protect them from damage or loss. Where the culverts are to be removed and disposed of, the pipes and appurtenances shall become the Contractor's property and shall be disposed of properly.

The Contractor shall perform all excavation, as may be necessary, to remove the existing culvert and appurtenances. This may include the removal of headwalls, riprap, broken concrete, rocks, and other material.

Where either the existing culvert or a new culvert is not to be installed at the location, the Contractor shall excavate all soil and material adjacent to the culvert to the original grades and contours. The area shall be graded to provide for proper drainage and to provide a smooth transition to undisturbed areas.

Soil and other material resulting from the removal of culverts shall be disposed of properly by the Contractor.

3.02 Excavation

The Contractor shall excavate, to the depths indicated on the plans, material of whatever nature is encountered. Existing pipes that are to be replaced, headwalls, riprap, and similar items may be encountered, in addition to soil.

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Where unsound material underlying the proposed culvert is encountered, the Engineer shall be notified immediately. If, in the Engineer's opinion, the material is unsuitable, the Contractor shall remove the material to the limits defined by the Engineer. The unsuitable material shall be replaced to the grade of the proposed culvert with sand and compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

Culvert bedding shall be constructed in accordance with the details shown on the plans. The trench shall be undercut at least 6 inches and a sand bedding compacted according to Section 01 45 16.02 – Density and Aggregate Testing. In stable soils, the soil under the pipe shall be hand excavated and shaped to fit the surface of the pipe. The excavation shall be to a depth necessary to support the bottom ¼ of the pipe circumference.

The area at each end of the pipe shall be excavated and shaped to provide a smooth transition to the adjacent ditch or swale.

3.03 Special Requirements for Corrugated Steel Pipe Culverts

The Contractor shall take special care when removing, salvaging, storing, handling, or placing new culverts or culverts that are to be relaid, so that they are not dented, scraped, or the galvanized coating is otherwise damaged.

Large diameter or long culverts shall be provided with shop attached lift rings to facilitate handling. Lift holes shall not be cut in corrugated steel pipe.

Saw cut ends of corrugated steel pipe shall be reasonably free from excessive jagged burrs or sharp spurs.

Surfaces on which the spelter coating has been damaged, whether by transporting, handling, or installation, shall be thoroughly cleaned by wire brushing and then painted with two coats of zinc rich paint conforming to federal specification: Paint shall be High Zinc Dust Content, Galvanizing Repair (Ready Mixed Type), MIL-P-21035.

3.04 Laying and Jointing Pipe

All pipe shall be laid true to the lines and grades given. Each length shall have full, firm bearing throughout its length.

A. Metal Pipe Jointing

Separate sections of corrugated pipe shall be securely joined together with standard corrugated metal bands. The bands may be up to 2 standard thicknesses lighter than the culvert, but shall not be less than 0.64 inches (16 gauge). Bands for culverts shall not be less than the following widths:

Pipe Diameter	Band Minimum Width
up to and including 18 inches	7 inches
21 inches through 60 inches	12 inches
over 60 inches	24 inches

The corrugations of the band shall match those of the pipes being joined. The band shall be secured with bolts and angles. Couplings may be either one piece or two pieces. Smooth coupling bands, dimpled bands, and helical-rod and lug bands will not be considered acceptable.

3.05 End Sections

End sections shall be attached to the ends of pipe culverts where directed. Metal end sections shall be used on metal culverts and on smooth lined plastic pipe culverts. Concrete end sections shall be used on concrete pipe culverts.

End sections shall be installed on firm ground. The slope adjacent to the end section shall be graded and shaped to meet the geometry of the end section.

3.06 Backfill

Backfill material within the 1:1 influence of a pavement or driving surface shall be backfilled with sand. Outside these areas, backfill may be soil which is free of organic material provided the soil can be backfilled according to Section 01 45 16.02 – Density and Aggregate Testing.

Backfill shall be placed evenly and alternately on each side of the pipe. Backfill shall be placed in 10-inch lifts and hand compacted to at least 12 inches over the crown of the pipe. Backfill material shall be sand and shall be compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

Backfill above 12 inches above the top of the pipe shall be sand and shall be compacted according to Section 01 45 16.02 – Density and Aggregate Testing.

The Contractor shall provide a sufficient cushion of earth over the culvert to protect it from damage if heavy equipment will be operated over it before backfilling and surfacing is complete.

In any case, pipe that is broken, bent, or otherwise damaged by the Contractor's operations shall be removed and replaced at the Contractor's expense.

3.07 Cleanout

The Contractor shall maintain all existing and proposed culverts free of sediment and debris until final acceptance.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of pipe culverts will be paid for at the contract unit price for the following pay item(s) which are specifically included on the proposal. Work not specifically listed on the proposal as a pay item is considered included in the pay item(s) which are listed and will not be paid for separately.

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Pay ItemPay UnitCulv End Sect, __ inchEach

4.02 Measurement

Culvert end sections will be measured in units of each, for the actual quantity of new end sections provided and installed by the Contractor and approved by the Engineer. For payment purposes, the end section size is considered to be the size of the culvert pipe to which it is connected.

4.03 Work Included

The unit price for culvert sloped end sections of the size or type required includes the cost of providing and placing end sections, including longitudinal and cross tubes, as detailed on the Michigan Department of Transportation's Standard Plans R-95 Series.

END OF SECTION

SECTION 33 44 00 STORM SEWERS

PART 1 - GENERAL

1.01 Work Included

This work includes construction of storm sewers, drainage structures, and appurtenances. Drainage structures include catch basins, inlets, manholes, and manhole tees.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. AASHTO M36 Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
- B. AASHTO M170 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- C. AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 300-mm to 1,500-mm (12-in. to 60-in.) Diameter
- D. ASTM A48 Standard Specification for Gray Iron Castings
- E. ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- F. ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- G. ASTM C478 Standard Specifications for Circular Precast Reinforced Concrete Manhole Sections
- H. ASTM D1056 Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
- I. ASTM D4101 Standard Specifications for Polypropylene Injection and Extrusion Materials
- J. Michigan Department of Transportation 2020 Standard Specifications for Construction
- K. Michigan Department of Transportation Standard Plans

1.03 Related Work

- A. Section 01 45 16.02 Density and Aggregate Testing
- B. Section 01 55 26 Maintaining Traffic
- C. Section 01 71 23.16 Construction Staking by Contractor
- D. Section 02 21 14 Color Audio-Video Survey of Construction Areas

- E. Section 31 23 01 Excavating, Filling, and Grading
- F. Section 31 25 00 Soil Erosion and Sedimentation Control
- G. Section 32 92 00 Turf Establishment
- H. Section 33 42 00 Culverts

1.04 Quality Assurance and Quality Control

A. Grade and Alignment

Grade and alignment shall be maintained using a laser. The Contractor shall verify that the sewer is constructed at the proper alignment by checking grades and offsets at each manhole, at 50 feet upstream from manholes, and at 100-foot intervals. The Contractor shall report asconstructed measurements to the Engineer.

B. Acceptance Tests

The completed sewer(s) shall be subjected to the following tests, prior to acceptance by the Owner. Acceptance tests shall be completed by the Contractor, in the presence of the Engineer (or Owner's representative).

1. Physical Inspection

The physical inspection shall be completed in accordance with Section 3.08.A.

PART 2 - PRODUCTS

2.01 Materials

A. Pipe

Unless a specific type, class or thickness is called for on the plans or in the proposal, material class shall meet the requirements of Pipe Alternates for Storm Sewer Classes, as described in Section 402 of the Michigan Department of Transportation 2020 Standard Specifications for Construction. Corrugated steel pipe may be used only where shown on the drawings.

1. Reinforced Concrete Pipe

Pipe shall meet ASTM C76. Where no class is shown on the drawings or on the proposal, Class III or better shall be provided.

Joints shall be rubber gaskets in accordance with ASTM C443.

Reinforced concrete pipe to be installed by jacking shall be Class V and shall be provided with full circular reinforcement. Pipe joints shall be butt type.

2. Smooth-Lined Corrugated Plastic Pipe

Where storm sewers from 12-inch to 24-inch diameter are called for on the plans, with at least 3 feet of cover over the pipe, and when a particular kind of sewer pipe is not specified, the Contractor may furnish smooth-lined corrugated plastic pipe (SLCPP).

SLCPP shall be corrugated polyethylene pipe meeting the requirements of AASHTO M294, Type S. Any fittings required shall also meet the requirements of AASHTO M294. Only

fittings supplied or recommended by the pipe manufacturer shall be used. When gaskets are used in couplings to provide watertight or silt-tight joints, gaskets shall be a band of expanded rubber meeting the requirements of ASTM D1056 for Type 2 closed cell rubber, or O-rings meeting the requirements of ASTM C443.

3. PVC Pipe

All PVC pipe shall be ASTM D3034 gasketed sewer pipe with a SDR of 26 or lower. PVC pipe conforming to ASTM D1785 Schedule 40 and ASTM D2665 is acceptable for 6-inch service leads.

4. Corrugated Galvanized Steel Pipe

Pipe with circular cross section and reformed pipe with pipe arch shape shall conform to AASHTO M36. The Contractor shall furnish the Owner with two copies of a certification of compliance, with the chemical requirements of the base metal, as specified in AASHTO M36.

Corrugated metal pipe shall be a minimum of 8-gauge or wall thickness of 0.168 inches.

For pipe arch shapes, minimum thickness shall be based on the next larger size if the actual span dimension is not listed.

B. End Sections

End sections shall be flared and beveled to conform with ditch slopes.

Metal end sections shall conform with AASHTO M36, where applicable. The metallic coating on the end sections shall be the same as on the pipe. End sections shall be furnished complete with coupling bands or hardware necessary for connecting them to the end of the pipe culvert.

Concrete end sections shall be constructed of precast concrete and reinforcement conforming to the requirements of AASHTO M170 (ASTM C76) Class III or as shown on the drawings. Connection of end section to concrete pipe shall be made by tongue and groove joints.

C. Drainage Structures

Drainage structures shall be precast concrete units meeting the requirements of ASTM C478 with rubber gaskets conforming to ASTM C443. Drainage structures shall be 4 feet in diameter, unless shown otherwise on the plans or in the proposal. Precast concrete grade rings meeting ASTM C478 shall be used to adjust the top of the structure to the final grade. At least 6 inches, but not more than 18 inches, of vertical adjustment shall be provided with grade rings. Manhole lifting holes shall not be permitted in the manhole sections. Lifting lugs shall be cast into the manhole for lifting.

Manhole steps shall be copolymer polypropylene plastic steps with a steel reinforcement bar, with a minimum diameter of ½-inch, a minimum width of 10 inches center to center of wall anchor, and complete with anti-skid side plates conforming to ASTM D4101. Steps shall be manufactured with the manhole wall and spaced at a maximum of 16 inches on center. Gray iron castings shall be heavy duty classification and shall conform to ASTM A48 Class 35B coated with asphalt coating.

D. Castings

Castings shall meet the requirements of the Michigan Department of Transportation 2020 Standard Specifications for Construction, and the Michigan Department of Transportation Standard Plans.

PART 3 - EXECUTION

3.01 Excavation

Excavation shall be completed in accordance with Section 31 23 01 – Excavating, Filling, and Grading

3.02 Pipelaying

Sections of sewer pipe shall be carefully laid in the prepared trench, bell ends upgrade, with the spigot end fully entered in the adjacent bell. Each section shall have firm bearing throughout its length and shall be substantially true to the line and grade required. The use of blocks to bring sections to grade will not be permitted.

Circular concrete pipe with lift holes shall be installed with the lift holes on top of the pipe. Holes shall be plugged with suitable concrete plugs before backfilling.

Existing live sewers that are to remain shall be carefully protected during construction of the new sewers. If they are damaged in any way, they shall be immediately repaired or replaced, as directed by the Engineer.

All junctions with house or building leads shall be made in a manner acceptable to the Engineer.

Flexible watertight joints shall be installed in accordance with the manufacturer's recommendations.

Connections to sewers owned by other agencies shall be done in accordance with their requirements.

Connections to existing sewers having a plug or bulkhead shall be made with a watertight joint. The plug or bulkhead shall be removed without damage to the sewer, and the plug material shall be removed from the sewer and properly disposed of.

If there are no openings in the existing pipe or structures at the point of connection, an opening shall be cut in the pipe or the structure sufficiently large enough to permit 3 inches of mortar to be packed around the entering pipe and the mortar pointed up smooth and flush with the inner wall. Pipe passing through pipe or structure walls shall be cut at the end to conform with the shape of the inside of the wall and to be flush therewith. On the outside of the pipe or structure, the entering pipe shall be encased with sufficient mortar to provide bearing under the pipe. Any existing pipe broken or cracked while making the connection shall be replaced at the Contractor's expense.

When replacing an existing sewer, connections to the original sewer or drain that are encountered shall be reconnected to the new sewer.

Sewers and drainage structures shall be reasonably free of accumulation of silt debris and other foreign matter at the time of final acceptance.

3.03 Backfill

Backfill shall meet the requirements of Section 31 23 01 – Excavating, Filling, and Grading.

3.04 Additional Requirements of Construction for SLCPP Sewers

SLCPP shall be installed in accordance with Section 3.01. and the additional requirements provided here.

Joints in SLCPP shall be wrapped with a 2-foot wide strip of non-woven geotextile filter fabric with a 1-foot lap at the fabric joint.

The installed pipe shall not be deformed such that any diameter is reduced by 5 percent or more. Deformed pipe shall be removed and replaced at the Contractor's expense. The completed pipeline shall be tested for deformation by the Contractor under the Engineer's supervision. The Contractor shall furnish a 9-point mandrel having a diameter equal to at least 95 percent of the original uninstalled inside diameter of the pipe. The mandrel shall meet the Engineer's approval. Mandrel testing shall be performed no less than thirty calendar days after installation.

3.05 Additional Requirements for Construction of Corrugated Steel Pipe Sewers

A. Laying and Jointing Pipe

All pipe shall be laid true to the lines and grades given. Each length shall have full, firm bearing throughout its length.

Separate sections of corrugated pipe shall be securely joined together with standard corrugated metal bands. The bands may be up to 2 standard thicknesses lighter than the culvert, but shall not be less than 0.64 inches (16-gauge). Bands for culverts shall not be less than the following widths:

Pipe Diameter	Band Minimum Width	
up to & including 18 inches	7 inches	
21 inches through 60 inches	12 inches	
over 60 inches	24 inches	

The corrugations of the band shall match those of the pipes being joined. The band shall be secured with bolts and angles. Couplings may be either one piece or two pieces. Smooth coupling bands, dimpled bands, and helical-rod and lug bands will not be considered acceptable.

3.06 End Sections

End sections shall be attached to the ends of pipe, where directed. Metal end sections shall be used on metal pipe and on smooth lined plastic pipe. Concrete end sections shall be used on concrete pipe.

End sections shall be installed on firm ground. The slope adjacent to the end section shall be graded and shaped to meet the geometry of the end section.

End sections shall be installed in accordance with Section 33 42 00 - Culverts.

3.07 Drainage Structures

Precast concrete units shall be placed on a 6-inch sand base, leveled, and thoroughly compacted. Joints shall be sealed with mortar. Joints shall be thoroughly wetted prior to sealing. The joints inside the structure shall be flush with the walls. Joints shall be completely filled with mortar.

Pipe or tile connections to concrete drainage structures shall extend through the structure wall and be cut flush with the inside surface. The opening around the pipe shall be neatly filled with mortar to prevent leakage.

Drainage structure covers shall be new and adjusted to the finish elevation using precast concrete grade rings. Covers shall be of the type called for on the plans. Covers and grade rings shall be set in full mortar beds.

Cover elevations given on the plans are for information only. The final elevation will be determined in the field, based on as-constructed conditions.

Drainage structures shall be maintained reasonably free of accumulations of silt, debris, and other foreign matter at the time of final acceptance.

3.08 Acceptance Tests - Storm Sewers

The methods of testing shall be approved by the Engineer. The Contractor shall provide the necessary equipment and labor for making the tests, and the cost of testing and repair shall be included in the unit price bid for completed storm sewer. The Engineer shall determine when grouting or relaying of faulty pipe is required.

A. Physical Inspection

Upon completion of all work, the Contractor shall open all manholes in the presence of the Engineer to demonstrate that the manholes are complete and free of debris.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of constructing storm sewers will be paid for at the contract unit price for the following pay item(s), which are specifically listed on the proposal. Work not specifically listed as a pay item on the proposal is considered included in the work listed and will not be paid for separately.

Pay Item	<u>Pay Unit</u>
Storm Sewer, Cl, inch, Tr Det	Foot
Storm Sewer, RCP Cl, inch, Tr Det	Foot
Storm Sewer Bulkhead, 6 inch or Larger	Each
Dr Structure, inch dia	Each
Dr Structure, Tap, inch	Each

4.02 Measurement and Work Included

A. Storm Sewer, Cl ___, __ inch, Tr Det ___

Where the plans do not specifically indicate that the storm sewer pipe shall be reinforced concrete pipe (RCP), the completed storm sewer of the size and trench detail shown on the drawings will be measured along the completed pipeline. There will be no deduction in the linear measurement for the diameter or width of new drainage structures. The linear measurement will not include the diameter or width of drainage structures at either the beginning or end of a section of new storm sewer. There will be no adjustment in the measurement or the unit price for variations in the depth of the sewer.

The work of constructing storm sewers includes all work necessary to construct the sewers, including all necessary excavation, bedding, and backfilling. Dewatering, if necessary to maintain dry and stable excavation, is included in the unit price for storm sewer, unless it is specifically listed as a pay item on the proposal.

The work of constructing storm sewers includes furnishing and installing curved or radius pipe, where included.

B. Storm Sewer, RCP Cl ___, __ inch, Tr Det ___

Reinforced concrete pipe storm sewer (RCP), of the size, class, and trench detail shown on the drawings, will be measured in units of feet along the completed pipeline, when reinforced concrete pipe storm sewer is specifically called for on the drawings or on the proposal. There will be no deduction in the linear measurement for the diameter or width of new drainage structures. The linear measurement will not include the diameter or width of drainage structures at either the beginning or end of a section of new storm sewer. There will be no adjustment in the measurement or the unit price for variations in the depth of the sewer.

The work of constructing storm sewers includes all work necessary to construct the sewers, including all necessary excavation, bedding, and backfilling. Dewatering, if necessary to maintain dry and stable excavation, is included in the unit price for storm sewer unless it is specifically listed as a pay item on the proposal.

The work of constructing storm sewers includes furnishing and installing curved or radius pipe, where included.

C. Storm Sewer Bulkhead

Storm sewer bulkheads 6 inches or larger will be paid at the contract unit price when shown on the plans or directed by the Engineer. Storm sewer bulkheads will be measured in units of each; there will be no adjustment or distinction because of differing sizes. Storm sewer bulkheads less than 6 inches shall be included in the other pay item(s) and shall not be paid for separately.

D. Dr Structure, __ inch dia

Drainage structures will be measured in units of each and paid for at the contract unit price for each, which is shown on the plans or authorized by the Engineer and has been completed by the Contractor. There will be no adjustment in the measurement or unit price for variations in the depths of structures.

The work of drainage structures includes furnishing and installing a casting of the type designated, providing grade rings for adjustment, and adjusting the casting to the proper elevation. The work also includes making all required pipe connections.

E. Dr Structure, Tap, inch

Pipe connections to existing structures will be paid at the contract unit price for Dr Structure Tap, __ inch when included as a pay item on the proposal. Drainage structure taps will be measured in units of each based on the size of the connecting pipe, with no adjustment made for differing structure depths or construction materials. The work of coring a hole, furnishing a flexible boot, and reworking the manhole channel are included in the work and will not be paid for separately.

END OF SECTION

SECTION 33 46 16 UNDERDRAINS

PART 1 - GENERAL

1.01 Work Included

This work includes constructing a subsurface drainage system.

1.02 References

Where materials or methods of construction are listed as being in conformance with a standard specification, it shall refer to the latest edition of the standard specification or any interim revision.

- A. AASHTO M36 Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
- B. AASHTO M218 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized), for Corrugated Steel Pipe
- C. AASHTO M252 Standard Specification for Corrugated Polyethylene Drainage Pipe
- D. AASHTO M274 Standard Specification for Steel Sheet, Aluminum-Coated (Type 2), for Corrugated Steel Pipe
- E. AASHTO M278 Standard Specification for Class PS46 Poly(Vinyl Chloride) (PVC) Pipe
- F. ASTM D1785 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- G. ASTM D3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- H. ASTM D3786 Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
- I. ASTM D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- J. ASTM D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- K. ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- L. ASTM D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile
- M. ASTM D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
- N. ASTM F949 Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
- O. ASTM F2806 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (Metric SDR-PR)
- P. Michigan Department of Transportation 2020 Standard Specifications for Construction

1.03 Related Work

A. Section 01 45 16.02 – Density and Aggregate Testing

PART 2 - PRODUCTS

2.01 Materials

A. Pipe for Underdrains

1. Smooth Plastic Pipe

Smooth plastic pipe shall be fabricated from polyvinyl chloride (PVC) pipe meeting AASHTO M278, or acrylonitrile-butadiene-styrene (ABS) pipe meeting ASTM F2806, or PVC SDR 35 pipe. Perforations shall meet the requirements of AASHTO M278.

2. Corrugated Plastic Tubing

Corrugated plastic tubing shall conform to AASHTO M252 for polyethylene (PE) tubing or ASTM F949 for polyvinyl chloride (PVC) tubing. Perforations shall meet the requirements of AASHTO M252.

B. Pipe for Outlets

Underdrain outlets into storm sewer drainage structures shall be fabricated from either PVC pipe meeting ASTM D1785, Schedule 40 or ASTM D 3034, Type SDR 23.5.

C. Stone

Stone shall be open graded aggregate meeting gradation and requirements of Series 34R, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

D. Sand

Sand shall meet the gradation and requirements of Granular Material Class II, as described in the Michigan Department of Transportation 2020 Standard Specifications for Construction.

E. Geosynthetic Fabric

Geosynthetic fabric for trench lining and pipe wrap shall be a non-woven geotextile meeting the following requirements:

Physical Property	Test Method	Physical Requirements
Grab Tensile Strength (minimum)	ASTM D4632	90 pounds
Trapezoid Tear Strength (minimum)	ASTM D4533	45 pounds
Puncture Strength (minimum)	ASTM D4833	45 pounds
Mullen Burst Strength (minimum)	ASTM D3786	140 pounds
Permittivity	ASTM D4491	0.5 per second
Apparent Opening Size (maximum)	ASTM D4751	0.21 mm

PART 3 - EXECUTION

3.01 Construction

Underdrains shall be constructed where shown on the plans or where directed by the Engineer.

Underdrain outlets shall be provided where shown on the plans or as necessary to provide positive drainage.

A. Trench Excavation

Trenches for underdrain installation shall be excavated using a wheel or chain type trencher, or other method which can excavate to the required depth and grade. The trench width shall be wide enough to accommodate installation of the drain pipe, or as necessary to prevent the trench walls from collapsing.

B. Laying Underdrains

Underdrains shall be laid to the line and grade shown on the plans or as directed by the Engineer. The trench bottom shall be uniform and provide uniform bearing for the pipe. Two inches of stone shall be laid in the bottom of the trench before the pipe is installed.

The underdrain pipe shall be fitted with the appropriate fittings (end caps, tees, bends, etc.) before the pipe is placed.

C. Connections

Joints for fittings and pipe shall be made using mechanical methods, which will prevent separation and not cause an obstruction in the pipe. Joints shall be wrapped with geotextile fabric. The fabric shall be sealed to the pipe with waterproof tape.

D. Backfill

Trenches shall not be backfilled until the Engineer has observed the installation.

Trenches shall be backfilled with sand. Sand shall be placed around the pipe and to a depth of 6 inches below the top of the curb or pavement. The remaining portion of the trench shall be backfilled with other material according to the plans. Trenches shall be compacted in accordance with Section 01 45 16.02 – Density and Aggregate Testing.

E. Underdrain Outlets

Underdrain outlets shall be installed immediately after installation of the underdrains.

Where storm sewers are present, underdrain outlets shall be connected to storm manholes, inlets, and catch basins. The underdrain shall be connected at each storm sewer structure which is available along the length of the underdrain.

Outlets shall be connected to drainage structures by coring a hole through the wall of the drainage structure, at least 4 inches above the invert elevation of the storm sewer pipe outlet. The hole shall be large enough to accommodate the underdrain pipe. The underdrain pipe shall be installed in the cored opening using either a flexible connection or by grouting the void between the pipe and structure wall.

Where storm sewers are not available, underdrain outlets shall be installed at intervals not exceeding 300 feet. Outlet pipes shall be run to the receiving ditch line at a minimum grade of 4 percent. The outlet elevation shall be at least 4 inches above the ditch bottom. A concrete collar shall be formed around the circumference of the outlet pipe. The outside diameter of the collar shall be 12 inches greater than the pipe diameter. The face of the concrete collar shall be sloped, flush with the side slope of the ditch.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Pay Items

The work of underdrains will be paid for at the contract unit price for the actual quantities of the following pay item(s), which are specifically included on the proposal.

Pay Item	<u>Pay Unit</u>
Underdrain, Subgrade, inch	Foot
Underdrain, Outlet Ending, inch	Each

All work necessary to complete underdrains is included in the work of underdrains, including trenching, furnishing and placing stone bedding, providing geotextile wrapped pipe, and backfilling.

Coring and connections to drainage structures is included in the work of underdrains and will not be paid for separately.

The work of Underdrain, Outlet Ending, __ inch includes excavating the area at the end of the outlet, providing and placing the concrete collar and pipe end treatment, providing and installing rodent screen (if applicable), and disposing of surplus excavated material.

4.02 Measurement

Underdrains will be measured along the actual length of pipe placed. The laying length of fittings and outlet pipe will be included in the measurement. The measurement will begin (or end) at the inside face of drainage structures where the underdrain outlet is connected to a drainage structure.

END OF SECTION

SECTION 34 41 15 PERMANENT TRAFFIC SIGNS

PART 1 - GENERAL

1.01 Work Included

This work includes furnishing and installing permanent signs at locations shown on the plans, in the proposal, or as directed by the Engineer in accordance with the Michigan Department of Transportation 2020 Standard Specifications for Construction, the Michigan Manual on Uniform Traffic Control Devices, and as specified herein.

All sign shapes and dimensions shall conform to the Michigan Manual on Uniform Traffic Control Devices.

1.02 References

- A. Michigan Department of Transportation 2020 Standard Specifications for Construction
- B. Michigan Manual on Uniform Traffic Control Devices

1.03 Submittals

The Contractor shall submit shop drawings, catalog cuts, or manufacturer's specifications to show the proposed signs, supports, and hardware.

1.04 Notifications

The Contractor shall contact MISS DIG (800-482-7171) to locate underground utilities in advance of excavating or driving sign posts or foundations. The Contractor shall notify utility agencies which may have underground utilities within the project area to arrange their location.

PART 2 - PRODUCTS

2.01 Materials

Materials for signs and supports shall meet the requirements of Section 919 of the Michigan Department of Transportation 2020 Standard Specifications for Construction.

PART 3 - EXECUTION

3.01 Sign Schedule

Signage shall be provided as called for on the plans or in the proposal.

3.02 Installation

Signs shall be installed in accordance with Section 810.03 of the Michigan Department of Transportation 2020 Standard Specifications for Construction.

PART 4 - MEASUREMENT AND PAYMENT

The work of Permanent Traffic Signs will be paid for at the contract lump sum price for the following pay item(s).

Pay ItemPay UnitPermanent Traffic SignsLump Sum

Payment shall be full compensation for all materials, labor, traffic control, and equipment necessary for the installations of permanent signs.

4.01 Work Included

Payment for wood posts includes the cost of providing and installing wood post sign supports in a sleeve in concrete. Providing and installing the sleeve and concrete is included in the pay item for wood posts and shall not be paid for separately.

Hardware for mounting the signs to the posts is included in the work and will not be paid for separately.

Signs designated for removal include removing supports, sign bands, concrete glare screen connections, or concrete median barrier connections, attaching or fastening hardware, and removing signs from supports.

Signs designated for salvaging and replacing, which are damaged as a result of the Contractor's activities, shall be replaced at the Contractor's expense.

END OF SECTION

CONSTRUCTION PLAN DRAWINGS FOR

ANN ARBOR PARKS & RECREATION BICENTENNIAL PARK

SECTION 10 T3S-R6E ANN ARBOR

WASHTENAW COUNTY, MICHIGAN



PROJECT

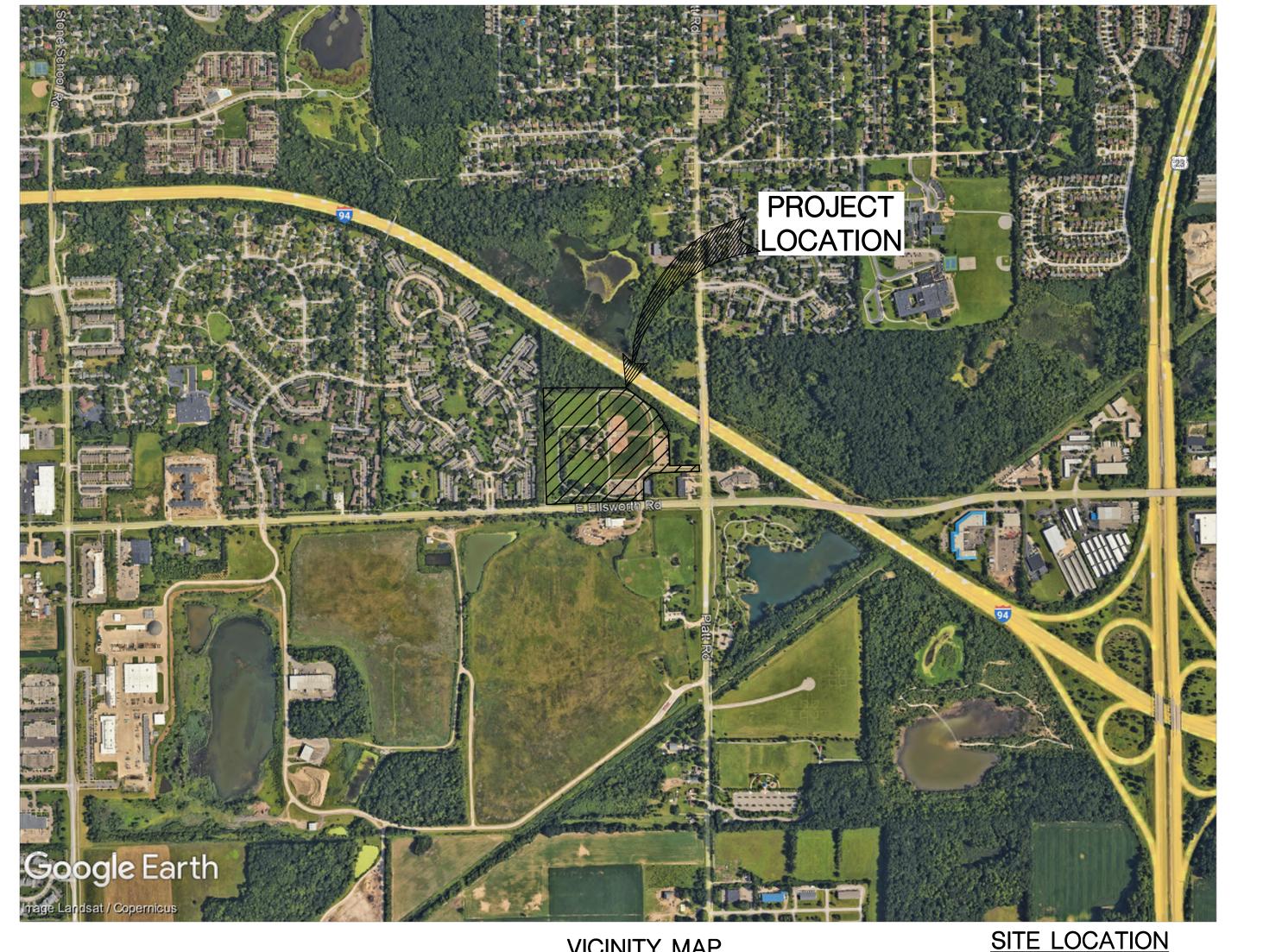
LOCATION

UTILITIES AND MUNICIPALITIES

NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO BE SATISFIED AS TO ITS ACCURACY AND THE LOCATION OF EXISTING UTILITIES.

NAME OF OWNER	<u>CONTACT</u>	TYPE OF UTILITY
ACD.NET 1800 N GRAND RIVER AVE LANSING, MI 48906	EVAN UNVERFERTH UNVERFERTH.EVAN@ACD.NET (517) 999-3249	FIBER
ANN ARBOR CITY 301 E. HURON ANN ARBOR, MI 48104	ANDY GOSSIAUX AGOSSIAUX@A2GOV.ORG	LAND USE POTABLE WATE SANITARY SEWI STORM SEWER
AT&T 550 S MAPLE RD ANN ARBOR, MI 48103	JASON HARRIS (586) 381-9246 JH147E@ATT.COM	TELEPHONE
DTE ENERGY 982 BROADWAY ST. ANN ARBOR, MI 48105	SARA A KIPP SARA.FORCE@DTEENERGY.COM	ELECTRIC
DTE ENERGY 982 BROADWAY ST. ANN ARBOR, MI 48105	ARAS P BUTKUNAS DET_MAPPINGTEAM@DTEENERGY.COM SEMI_GASDESIGN@DTEENERGY.COM	GAS
VERIZON	NONE GIVEN	FIRFR

SHEET INDEX			
	SHEET NUMBER	SHEET TITLE	
	C100	CIVIL COVER SHEET	
	C101	CIVIL GENERAL LEGEND	
	C102	CIVIL GENERAL NOTES	_ ^
(C103	CIVIL PROJECT QUANTITIES	3/2
	C104	CIVIL SOIL EROSION KEY	
\	C105-C108	CIVIL DETAILS) A
(C109	LINER DETAILS	5
	C110	CIVIL EXISTING CONDITIONS	
\	C111	CIVIL TREE INVENTORY) 🔥
(C200	CIVIL DEMOLITION SHEET)
	C210	CIVIL OVERALL SITE PLAN	\sim $\sqrt{2}$
6	C211	CIVIL DETAILED SITE PLAN	<u></u>
	C300	CIVIL OVERAL GRADING AND SESC PLAN	
	C303-C306, C311	CIVIL DETAILED GRADING PLAN	
{	C400	CIVIL UTILITY PLAN	<u>}/1\ /2\</u>
	C402	CIVIL STORM SEWER PROFILES	~ A
	LA100	CIVIL LANDSCAPE PLAN	
	N/A	ARCHITECTURAL PLANS (MEP PLANS)	
	N/A	PENCHURA/AQUATIX PLANS	



ENGINEER INFORMATION

ROWE PROFESSIONAL SERVICES COMPANY 540 S. SAGINAW ST., SUITE 200 FLINT, MI 48502 DOUG SCHULTZ, PLA (810) 869-5170

VICINITY MAP NOT TO SCALE

OWNER INFORMATION

2901 E ELLSWORTH RD, ANN ARBOR, MI 48108

ANN ARBOR PARKS & RECREATION ADAM FERCHO, PARK PLANNER AND LANDSCAPE ARCHITECT 301 E. HURON ST. ANN ARBOR, MICHIGAN 48104 PHONE: (734) 974-6230 EXT. 42549 EMAIL: AFERCHO@A2GOV.ORG

SCOTT SPOONER, PARKS AND RECREATION SERVICES DEPUTY MANAGER-MAINTENANCE 4251 STONE SCHOOL ROAD, ANN ARBOR, MICHIGAN 48104 PHONE: (734) 974-6230 EXT. 43319 EMAIL: SŚPOONER@A2GOV.ORG

PROJECT DESCRIPTION

RETENTION POND, AND IMPROVEMENTS TO AN EXISTING PAVILION AND RESTROOM FACILITY.

LEGAL DESCRIPTION

PARCEL NUMBER 09-12-10-401-015 LEGAL DESCRIPTION:

PUBLIC ROW, ALSO EXC COM AT SE COR OF SD SEC 10, TH N 1 DEG E 336.2 FT FOR POB, TH N 89 DEG W 264.44 FT, TH N 1 DEG E 417.74 FT, TH S 55 DEG 16 MIN E 317.98 FT, TH S 1 DEG W 241.16 FT TO POB, 26.27 AC M/L

GENERAL NOTES

FOR ALL CONSTRUCTION ACTIVITY THAT DISTURBS 5 ACRES OR MORE OF LAND, THE OWNER OF THE PROPERTY SHALL OBTAIN AN NPDES STORM WATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FROM THE EGLE AS REQUIRED UNDER P.A. 245. THE NOTICE OF COVERAGE APPLICATION SHALL BE SUBMITTED THROUGH THE EGLE MIWATERS WEB SITE. THE DISTURBED AREA FOR THIS PROJECT IS APPROXIMATELY 4.88 ACRES. A NPDES PERMIT IS NOT REQUIRED FOR THIS PROJECT.

NAME OF AND DISTANCE TO NEAREST LAKE, STREAM OR DRAIN: THE PROJECT IS LOCATED APPROXIMATELY 150 FEET EAST OF THE SWIFT DRAIN.

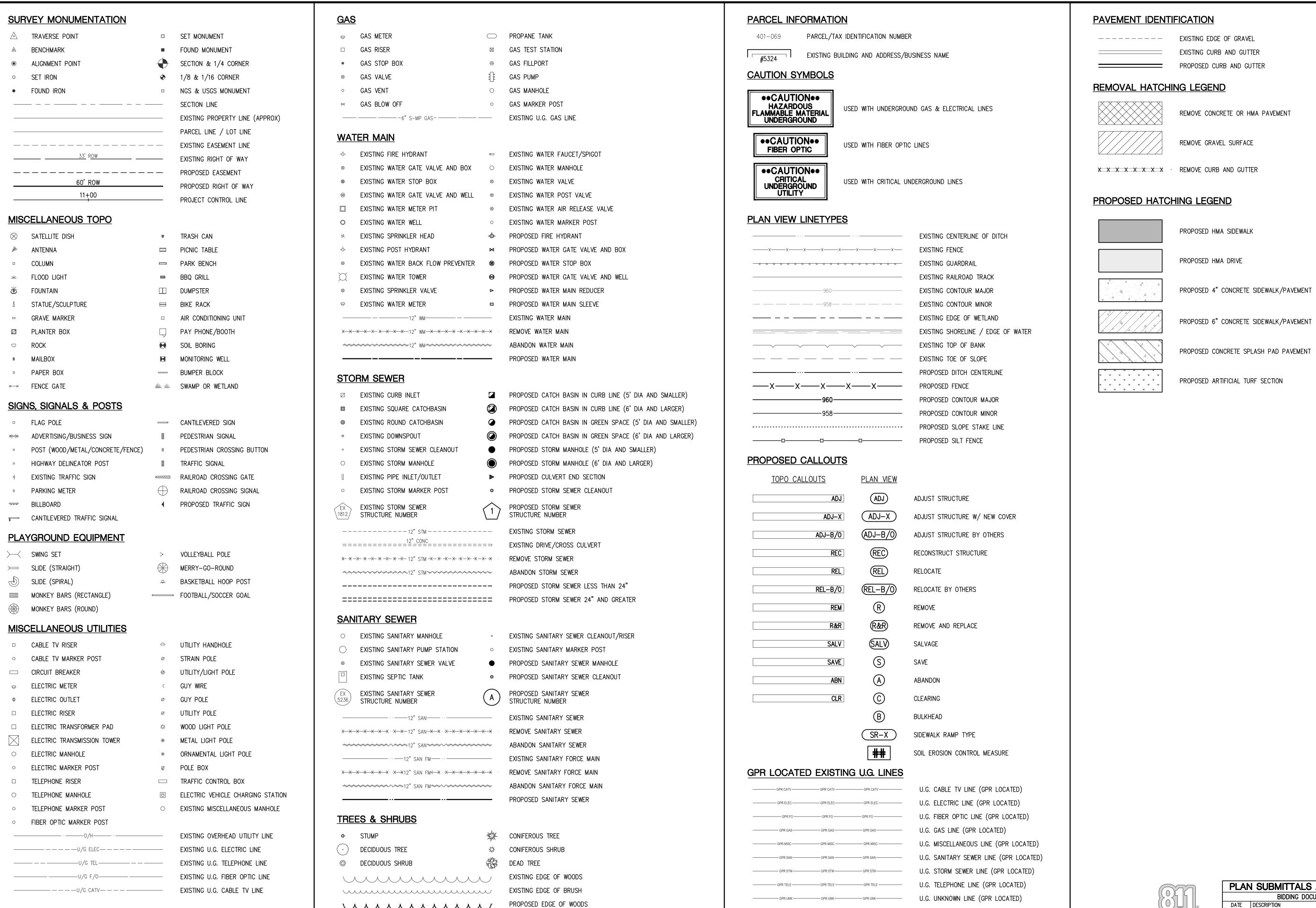


Know what's **below**. Call before you dig.

Revised 01/28/2025 8:44:52 AM

P	PLAN SUBMITTALS AND CHANGES		
		BIDDING DOCUMENTS	
D	ATE	DESCRIPTION	
3/	4/24	ISSUED FOR BIDS	
6/2	25/24	BULLETIN 1	
9/	9/24	BULLETIN 2	
1/2	4/25	PHASING PLAN	

JOB No: 2300634



PROPOSED EDGE OF BRUSH



×

(810) (810)

ARBOR PARK CITY

PLAN SUBMITTALS AND CHANGES **BIDDING DOCUMENTS** DATE DESCRIPTION 3/4/24 ISSUED FOR BIDS

Know what's **below.** Call before you dig.

U.G. WATER LINE (GPR LOCATED)

REV: sнт# **С101** JOB No: 2300634

GENERAL CONSTRUCTION NOTES

EMERGENCY CONTACTS

BEFORE BEGINNING WORK ON THE PROJECT, THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH THE NAMES AND TELEPHONE NUMBERS OF EMERGENCY CONTACTS. AT LEAST ONE PERSON REPRESENTING THE CONTRACTOR SHALL BE AVAILABLE TO RESPOND TO EMERGENCIES THROUGHOUT THE LIFE OF THE PROJECT, 24 HOURS A DAY, 7 DAYS A WEEK.

UNDERGROUND UTILITY IDENTIFICATION AND LOCATION

THE CONTRACTOR SHALL CALL MISS DIG (1-800-482-7171) A MINIMUM OF THREE WORK DAYS IN ADVANCE OF BEGINNING EXCAVATION. THE CONTRACTOR IS RESPONSIBLE TO IDENTIFY AND NOTIFY UTILITY AGENCIES WITHIN THE PROJECT AREA WHICH DO NOT PARTICIPATE IN THE MISS DIG NOTIFICATION PROGRAM.

PUBLIC UTILITIES

EXISTING UTILITIES ARE SHOWN BASED UPON RECORDS AND LOCATIONS PROVIDED BY UTILITY AGENCIES. THE INFORMATION SHOWN IS CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR. UNLESS THE PLANS SPECIFICALLY SHOW THAT EXISTING UTILITIES ARE TO BE MOVED, THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN EXISTING UTILITIES.

VERIFICATION OF UNDERGROUND UTILITIES

THE CONTRACTOR SHALL EXCAVATE AND LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA IN ADVANCE OF CONSTRUCTION TO VERIFY THEIR ACTUAL LOCATION. POTENTIAL CONFLICTS SHALL BE REPORTED TO THE ENGINEER. THE CONTRACTOR SHALL MAKE SUCH CHANGES TO GRADE AND ALIGNMENT OF PROPOSED WORK AS DIRECTED BY THE ENGINEER TO AVOID CONFLICTS, AT NO INCREASE IN COST TO THE OWNER.

UTILITY SERVICE

UNLESS SPECIFICALLY PROVIDED OTHERWISE IN THE CONTRACT DOCUMENTS, ALL EXISTING UTILITIES ARE TO REMAIN IN SERVICE DURING THE PROJECT.

MAILBOXES

MAILBOXES LOCATED WITHIN THE LIMITS OF EXCAVATION, GRADING, OR CONSTRUCTION SHALL BE REMOVED AND PROTECTED FROM DAMAGE BY THE CONTRACTOR. TEMPORARY MAILBOXES SHALL BE PROVIDED AND MAINTAINED DURING THE PROJECT. UPON COMPLETION OF GRADING OR CONSTRUCTION ACTIVITIES, THE ORIGINAL MAILBOX SHALL BE REINSTALLED.

MAILBOXES (AND/OR SUPPORTS) WHICH ARE DAMAGED AS A RESULT OF THE PROJECT SHALL BE REPLACED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE. MAILBOXES SHALL BE REPLACED IN ACCORDANCE WITH THE STANDARDS OF THE U.S. POSTAL SERVICE AND THE REGULATIONS OF THE AGENCY HAVING JURISDICTION OVER THE ROADS AND STREETS IN THE PROJECT AREA.

PRIVATE IRRIGATION SYSTEMS

WHERE IRRIGATION SYSTEMS WITHIN THE PUBLIC RIGHT-OF-WAY WILL INTERFERE WITH THE PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNERS THAT IT IS THEIR RESPONSIBILITY TO REMOVE AND PROTECT THEIR IRRIGATION SYSTEM. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A COPY OF THE NOTIFICATION.

WHERE THE OWNER HAS NOT REMOVED THEIR PRIVATE IRRIGATION SYSTEM, THE CONTRACTOR SHALL CUT AND PLUG THOSE SECTIONS OF PIPING WHICH INTERFERE WITH CONSTRUCTION. SPRINKLER HEADS, VALVES, AND PIPING WHICH INTERFERES WITH THE CONTRACTOR'S WORK, SHALL BE REMOVED AND STOCKPILED ON THE OWNER'S PROPERTY.

SOIL BORINGS / PAVEMENT CORES

IF PROVIDED ON THE PLANS OR IN THE CONTRACT DOCUMENTS, LOGS OF SOIL BORINGS OR PAVEMENT CORES REPRESENT THE SUBSURFACE CONDITIONS ENCOUNTERED AT SPECIFIC POINTS. THE INFORMATION IS PROVIDED FOR THE CONTRACTOR'S INFORMATION ONLY.

MAINTAINING TRAFFIC

LOCAL AND EMERGENCY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES WITHIN THE PROJECT AREA.

WHEN EXCAVATION, FRESH CONCRETE, OR OTHER CONSTRUCTION WORK WILL RESULT IN THE CLOSURE OF A STREET OR DRIVEWAY FOR A PERIOD OF TIME, THE CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL AFFECTED RESIDENTS AND BUSINESSES IN ADVANCE.

THE CONTRACTOR SHALL NOTIFY EMERGENCY RESPONSE AGENCIES IN ADVANCE OF ROAD CLOSURES OR THE ESTABLISHMENT OF DETOURS.

TRAFFIC SIGNS

TRAFFIC SIGNS WHICH INTERFERE WITH CONSTRUCTION SHALL BE REMOVED AND REPLACED BY THE AGENCY HAVING JURISDICTION OVER THE STREETS OR ROADS IN THE PROJECT AREA. THE CONTRACTOR IS RESPONSIBLE TO CONTACT THE AGENCY TO ARRANGE FOR REMOVAL OF THE SIGN AND IS RESPONSIBLE TO PAY ANY FEES ASSOCIATED WITH THE REMOVAL AND REPLACEMENT OF THE SIGNS.

SCHEDULE

THE CONTRACTOR SHALL COMPLETE ALL WORK IN AN EXPEDITIOUS MANNER AND SHALL NOT STOP WORK ON THE PROJECT ONCE BEGUN.

ALIGNMENT

ALIGNMENT AND GRADES FOR CURB AND GUTTER (INCLUDING THROUGH RAMPS AND DRIVEWAY OPENINGS) SHOWN ON THE PLANS ARE FOR THE TOP, BACK OF CURB, UNLESS SPECIFICALLY SHOWN OTHERWISE ON

THE HORIZONTAL ALIGNMENT SHOWN ON THE DRAWINGS FOR DRAINAGE STRUCTURES LOCATED IN THE CURB LINE IS TO THE CENTER OF THE CASTING.

THE HORIZONTAL ALIGNMENT SHOWN ON THE DRAWINGS FOR DRAINAGE STRUCTURES WHICH ARE NOT IN THE CURB LINE AND FOR MANHOLES IS TO THE CENTER OF THE STRUCTURE.

WHERE RIM ELEVATIONS ARE PROVIDED ON THE PLANS FOR MANHOLE CASTINGS, THE ELEVATION PROVIDED IS FOR THE TOP OF THE CASTING.

WHERE RIM ELEVATIONS ARE PROVIDED FOR INLET TYPE CASTINGS, THE ELEVATIONS ARE PROVIDED AS

 CURB INLETS – THE ELEVATION OF THE TOP OF CURB ALL OTHER INLETS — THE ELEVATION OF THE FLOW LINE

WHERE RIM ELEVATIONS ARE PROVIDED ON THE PLANS FOR INLETS OR MANHOLE CASTINGS, THE ELEVATIONS PROVIDED ARE CONSIDERED PRELIMINARY. THE CONTRACTOR SHALL MAKE THE FINAL ADJUSTMENT FOLLOWING THE ESTABLISHMENT OF ACTUAL GRADING AND PAVEMENT ELEVATIONS.

CONSTRUCTION STAKING

WHEN CONSTRUCTION STAKING IS TO BE PROVIDED BY THE ENGINEER OR OWNER, THE CONTRACTOR SHALL REQUEST STAKING AT LEAST THREE WORKING DAYS IN ADVANCE.

WHEN CONSTRUCTION STAKING IS TO BE PROVIDED BY THE ENGINEER OR OWNER, STAKING WILL BE PROVIDED ONE TIME. THE CONTRACTOR SHALL PROTECT AND PRESERVE SURVEY CONTROL AND STAKING. RE-STAKING WILL BE AT THE CONTRACTOR'S EXPENSE.

SURVEY CORNERS, BENCHMARKS, AND CONTROL POINTS

THE CONTRACTOR SHALL PRESERVE ALL GOVERNMENT CORNERS, PROPERTY CORNERS, BENCHMARKS, SURVEY CONTROL POINTS AND OTHER SURVEY POINTS WITHIN THE PROJECT AREA. WHERE CORNERS, BENCHMARKS, OR SURVEY POINTS ARE ENCOUNTERED WHICH WILL BE DISTURBED BY THE CONTRACTOR'S ACTIVITIES: A LICENSED SURVEYOR SHALL WITNESS THE POINT BEFORE DISTURBANCE AND SHALL RE-SET THE POINT FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL PAY THE SURVEYOR TO WITNESS AND TO RE-SET THE POINTS.

PROTECTION OF TREES, SHRUBS, AND LANDSCAPING

ALL TREES, SHRUBS, AND LANDSCAPING WITHIN THE CONSTRUCTION AREA WHICH ARE NOT SPECIFICALLY DESIGNATED FOR REMOVAL SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. DAMAGED TREES, SHRUBS, AND LANDSCAPING SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

CONSTRUCTION SIGNING AND BARRICADING

THE CONTRACTOR SHALL PROTECT HAZARDOUS AREAS WITH BARRICADES. BARRICADES LEFT IN PLACE AFTER SUNSET SHALL BE LIGHTED.

THE CONTRACTOR SHALL PROVIDE SUITABLE SANDBAGS OR OTHER SUITABLE MEASURES FOR ANCHORING OF TEMPORARY SIGNS AND BARRICADES, TO PREVENT THEIR TIPPING OR DISPLACEMENT BY WIND OR AIR FLOW FROM VEHICLES.

THE CONTRACTOR SHALL PROVIDE SIGNING, BARRICADES, TRAFFIC REGULATORS, CONES, AND OTHER TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER STREETS OR ROADS IN THE PROJECT AREA, THE CURRENT MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND THE PLANS AND SPECIFICATIONS.

THE CONTRACTOR SHALL COVER OR REMOVE TEMPORARY SIGNS DURING PERIODS WHEN THEY ARE NOT APPROPRIATE.

TURF ESTABLISHMENT

ALL DISTURBED AREAS WHICH ARE NOT TO BE SURFACED WITH PAVEMENT, AGGREGATE OR OTHER APPROVED SURFACES SHALL BE ESTABLISHED WITH TURF.

TURF AREAS SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE.

DISTURBED AREAS SHALL BE SURFACED WITH THREE INCHES OF SCREENED TOPSOIL.

THE CONTRACTOR IS RESPONSIBLE TO ESTABLISH TURF WHICH IS SUBSTANTIALLY FREE OF BARE SPOTS AND FREE OF WEEDS. THE GROUND SURFACE IN TURF AREAS SHALL BE SMOOTH AND PROVIDE A NATURAL TRANSITION TO ADJACENT, UNDISTURBED AREAS.

THE CONTRACTOR IS RESPONSIBLE TO PROVIDE WATERING, WEEDING, RESEEDING, AND REWORKING AS NECESSARY TO ESTABLISH TURF AREAS TO THE REQUIRED STANDARD.

ADA COMPLIANCE

ALL PROPOSED CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AND APPLICABLE GUIDELINES OR STANDARDS. WHERE EXISTING CONDITIONS AND/OR THE REQUIREMENTS OF THE PLANS WILL RESULT IN FINISHED CONDITIONS THAT DO NOT MEET THE ADA REQUIREMENTS, GUIDELINES, OR STANDARDS; THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO REMOVE AND REPLACE WORK DETERMINED TO BE NOT IN ACCORDANCE WITH APPLICABLE REQUIREMENTS, GUIDELINES, OR STANDARDS.

BACKFILL AND EMBANKMENT

BACKFILL OF AN EXCAVATION UNDER OR WITHIN THE ONE ON ONE INFLUENCE OF AN EXISTING OR PROPOSED ROAD, SIDEWALK, DRIVEWAY, PAVEMENT, OR AGGREGATE SURFACE, SHALL BE SAND, MEETING THE REQUIREMENTS OF GRANULAR MATERIAL CLASS III AS DESCRIBED IN THE CURRENT MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION. THE SAND BACKFILL SHALL BE COMPACTED TO AT LEAST 95% OF ITS MAXIMUM UNIT WEIGHT.

BACKFILL OF AN EXCAVATION WHICH IS NOT UNDER OR WITHIN THE ONE ON ONE INFLUENCE OF AN EXISTING OR PROPOSED ROAD, SIDEWALK, DRIVEWAY, PAVEMENT, OR AGGREGATE SURFACE MAY BE SUITABLE EXCAVATED MATERIAL OR OTHER SOIL, WHICH IS FREE OF ORGANIC MATTER, STONES AND ROCKS, ROOTS, BROKEN CONCRETE, FROZEN MATERIAL, OR DEBRIS. THE BACKFILL SHALL BE COMPACTED TO AT LEAST 90% OF ITS MAXIMUM UNIT WEIGHT.

THE CONTRACTOR SHALL INDICATE THE SOURCE OF SAND USED FOR BACKFILL TO THE ENGINEER, AND PROVIDE THE ENGINEER WITH THE RESULTS OF A GRADATION TEST PERFORMED ON A SAMPLE OF THE SAND. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF USING SAND FROM OTHER SOURCES.

EMBANKMENT USED TO BUILD THE SUBGRADE TO REQUIRED ELEVATION SHALL BE SUITABLE SOIL EXCAVATED FROM THE PROJECT SITE, OR FURNISHED BY THE CONTRACTOR FROM OTHER SOURCES. SUITABLE SOIL IS FREE FROM ORGANIC MATTER, ROCKS AND STONES, FROZEN MATERIAL, BROKEN CONCRETE, AND DEBRIS.

EMBANKMENT CONSTRUCTED OF GRANULAR SOILS SHALL BE COMPACTED IN LIFTS NOT EXCEEDING 10 INCHES TO AT LEAST 95% OF ITS MAXIMUM UNIT WEIGHT.

EMBANKMENT CONSTRUCTED OF COHESIVE SOILS SHALL BE COMPACTED IN LIFTS NOT EXCEEDING 10 INCHES TO AT LEAST 95% OF ITS MAXIMUM UNIT WEIGHT.

DENSITY TESTING

THE MAXIMUM UNIT WEIGHT OF SAND AND OTHER GRANULAR SOILS WILL BE DETERMINED BY THE ONE POINT CONE TEST, AS DESCRIBED IN THE MICHIGAN DEPARTMENT OF TRANSPORTATION'S DENSITY TESTING AND INSPECTION MANUAL EXCEPT WHEN ANOTHER TEST METHOD IS SPECIFIED.

THE MAXIMUM UNIT WEIGHT OF COHESIVE SOILS WILL BE DETERMINED BY THE ONE POINT PROCTOR TEST. AS DESCRIBED IN THE MICHIGAN DEPARTMENT OF TRANSPORTATION'S DENSITY TESTING AND INSPECTION MANUAL, EXCEPT WHEN ANOTHER TEST METHOD IS SPECIFIED.

WORK HOURS

UNLESS PROVIDED OTHERWISE IN THE CONTRACT DOCUMENTS OR LIMITED BY LOCAL ORDINANCE, THE CONTRACTOR SHALL WORK WITHIN OF THE FOLLOWING TIMES, UNLESS OTHERWISE APPROVED BY THE OWNER: MONDAY THROUGH FRIDAY 7 A.M. TO 8 P.M. SATURDAY 8 A.M. TO 6 P.M.

THE CONTRACTOR SHALL NOT WORK ON SUNDAYS OR HOLIDAYS, UNLESS OTHERWISE APPROVED BY THE OWNER.

DRAINAGE

THE CONTRACTOR SHALL MAINTAIN DRAINAGE OF THE PROJECT AREA AND ADJACENT AREAS. WHERE EXISTING DRAINAGE FACILITIES ARE DISTURBED OR BLOCKED BY CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY PROVISIONS FOR DRAINAGE.

WHERE CONSTRUCTION HAS DISTURBED EXISTING DITCHES, SWALES, OR OTHER DRAINAGE FACILITIES; THE CONTRACTOR SHALL RESTORE THEM TO THEIR GRADES AND DIMENSIONS WHICH EXISTED PRIOR TO THE BEGINNING OF CONSTRUCTION, UNLESS DIRECTED OTHERWISE.

DRAINAGE SHALL NOT BE REROUTED ONTO ADJACENT PROPERTIES NOR ALLOWED TO DRAIN ONTO ADJACENT PROPERTIES AT AN INCREASED RATE, AS A RESULT OF THE CONTRACTOR'S WORK.

DRIVEWAY CONSTRUCTION

DRIVEWAY SLOPES SHALL NOT EXCEED 10%, EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE ON THE PLANS OR DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL PROVIDE PROPERTY OWNERS WITH SUITABLE NOTICE BEFORE REMOVING AND REPLACING AN EXISTING DRIVEWAY.

SIDEWALK CONSTRUCTION

SIDEWALKS SHALL BE CONSTRUCTED TO PROVIDE POSITIVE DRAINAGE OF THE SIDEWALK AND ADJACENT

EXCEPT WHERE NECESSARY TO PROVIDE POSITIVE DRAINAGE OR MEET EXISTING SURFACES, SIDEWALK SHALL BE CONSTRUCTED WITH A CROSS SLOPE SLOPED TOWARD THE STREET.

SIDEWALK CROSS SLOPES SHALL NOT EXCEED 2%.

IN TURF AREAS, THE SURFACE OF THE SIDEWALK SHALL BE ABOUT 1/4 INCH HIGHER THAN THE ADJACENT GROUND SURFACES, EXCEPT WHERE NECESSARY TO PROVIDE POSITIVE DRAINAGE OR MEET EXISTING SIDEWALKS, CURBS, OR PAVEMENTS.

SIDEWALK SHALL BE CONSTRUCTED ON A SAND BASE, COMPACTED TO AT LEAST 95% OF ITS MAXIMUM UNIT

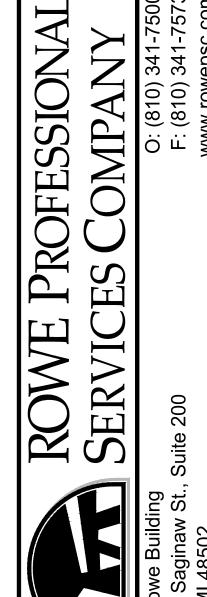
THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN SIDEWALK FORMS HAVE BEEN SET AND THE SAND BASE PREPARED. CONCRETE SHALL NOT BE PLACED UNTIL THE ENGINEER HAS OBSERVED THE FORMS. CONCRETE DELIVERY SHALL BE SCHEDULED TO ALLOW SUFFICIENT TIME FOR ADJUSTMENT OF THE FORMS, IN THE EVENT THAT ADJUSTMENT IS NECESSARY.

THE CONTRACTOR SHALL PROTECT FRESH CONCRETE FROM DAMAGE BY THE WEATHER, TRAFFIC, OR VANDALISM. DAMAGED CONCRETE SHALL BE REPLACED BY THE CONTRACTOR'S EXPENSE.

STORM SEWER CONSTRUCTION NOTES

DRAINAGE STRUCTURES SHALL BE CONSTRUCTED FROM PRECAST CONCRETE MANHOLE SECTIONS MEETING

SUMPS IN DRAINAGE STRUCTURES AND PIPELINES SHALL BE FREE OF SEDIMENT AND DEBRIS AT THE TIME OF ACCEPTANCE BY THE OWNER.



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PROJECT

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ARBOF PARK DUNTY NOTES

CITY OF ANN
BICENTENNIAL
WASHTENAW CC
CIVIL GENERAL 1

Know what's **below.** Call before you dig.

PLAN SUBMITTALS AND CHANGES BIDDING DOCUMENTS REV: DATE DESCRIPTION 3/4/24 ISSUED FOR BIDS JOB No: 2300634

PROVIDED BY PENCHURA (NOT IN CONTRACT) DESCRIPTION Splash Pad Spray Features, Mech 2.0 with Wrap, Rain Diverter, Backflow Preventor, Storage Building, Play Equipment, Swings, Site Furnishings and Forever Lawn Safety Surface and Stone Base Supply and Preparation 1 LSUM

NOTE:

EQUIPMENT PROVIDED BY PENCHURA WILL BE DELIVERED AT 4150 PLATT

WORK BY OTHERS (NOT IN CONTRACT)									
DESCRIPTION	QUANTITY	UNITS							
Solar Parking Shelters	1	LSUM							
Emergency Phone	1	Ea							
Park Entry Sian Improvement	1	LSUM							

Prepare Subbase for Safety Surface

Install Site Furnishing

Pavilion Improvements (Includes removal of old roof system, and installation of new T&G roof decking and standing seam roof) - (removed from project by owner)
Clearing

Quercus Macrocarpa, 5 inch caliper Acer Rubrum, 2.5 inch caliper

Betula Nigra, 2.5 inc caliper EGLE Permit

Storm Water Discharge Permit and Sewer Cleanout

DESCRIPTION	QUANTITY	UNITS
nstall Splash Pad	1	LSUM
nstall Playground Equipment	1	LSUM
nstall Shade Sails	1	LSUM
Prepare Subbase for Safety Surface	7000	Sft
nstall Site Furnishings	1	LSUM
Shower Tower and Catch Basin	1	LSUM
Pavilion Improvements	1	LSUM
Restroom Improvements	1	LSUM
Splash Pad Signage	3	Ea
Backflow Preventer, Enclosure and Concrete Pad	1	LSUM
Misc Structures, Rem	1	LSUM
Clearing (By City)	1	LSUM
Storm Sewer, Rem, Less than 24 inch	175	Ft
Pavt, Rem	2600	Syd
Concrete Curb, Rem	20	Ft
Concrete Curb	20	Ft
Chain Link Fence, Vinyl Coated, 4'	630	Ft
Sidewalk, Conc, 4 inch	20000	Sft
Sidewalk, Conc, Splash Pad	1850	Sft
Water Service, Type K Copper, 1 inch, Tr Det F	175	Ft
Water Service, Type K Copper, 1 inch, Tr Det G	75	Ft
Curb Stop and Box, 1 inh	1	Ea
<u> </u>	1	
Water Main Tap, 8 inch (By City)	1	Ea
Sewer Cleanout	3	Ea El
Storm Sewer, Cl A, 4 inch, Tr Det A	35	Ft
Storm Sewer, RCP CI III, 12 inch, Tr Det A	49	Ft
Storm Sewer, RCP CI III, 18 inch, Tr Det A	133	Ft
Storm Sewer, RCP CI III, 18 inch, Tr Det B	6	Ft
Culv End Sect, 12 inch	2	Ea
Culv End Sect, 18 inch	1 -	Ea -
Or Structure, 48 inch dia	3	<u>Ea</u>
Outlet Control Structure	1	Ea _
Storm Sewer, Tap, 12 inch	1	Ea
Storm Sewer, Tap, 15 inch	1	<u>Ea</u>
Or Structure Cover, Adj, Case 2	1	Ea
Monitoring Well, Adjust	2	Ea
Electrical Conduit, 2 inch	1500	Ft
Earthwork	1	LSUM
Non Haz Contaminated Material Handling and Disposal	2	Cyd
Quercus Macrocarpa, 5 inch caliper (By Others)	1	Ea
Acer Rubrum, 2.5 inch caliper (By Others)	6	Ea
Betula Nigra, 2.5 inch caliper (By Others)	7	Ea
Seeding, Lowland	650	Syd
Turf Establishment	1	LSUM
Erosion Control, Silt Fence	2200	Ft
Erosion Control, Inlet Protecton, Fabric Drop	6	Ea
Construction Staking	1	LSUM
Mobilization	1	LSUM

All work to be completed as Phase 1A unless noted otherwise

Phase 1B work items highlighted in yellow

The Rowe Building

The Rowe Building

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CITY OF ANN A BICENTENNIAL F

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PLAN SUBMITTALS AND CHANGES

BIDDING DOCUMENTS

DATE DESCRIPTION

3/4/24 ISSUED FOR BIDS

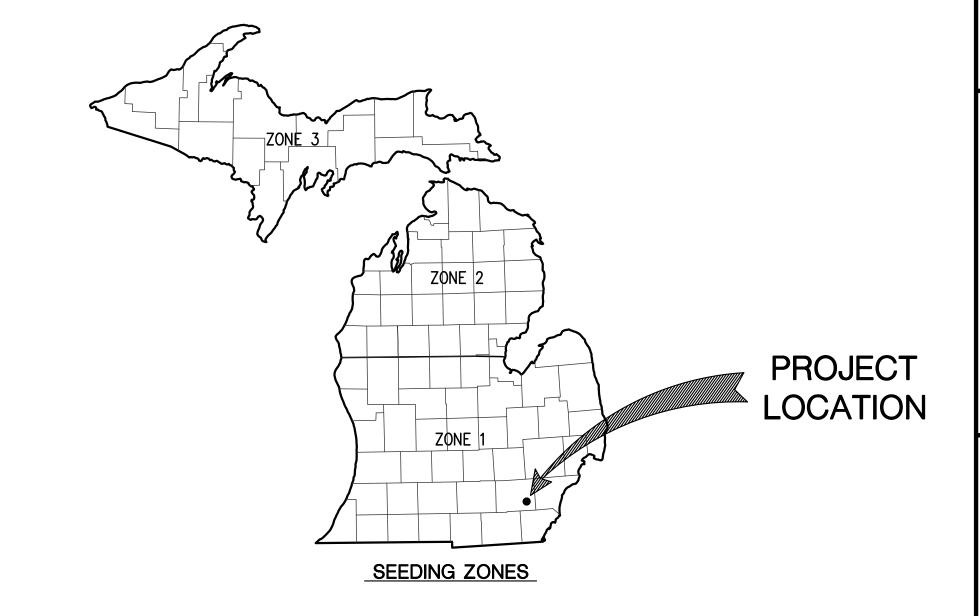
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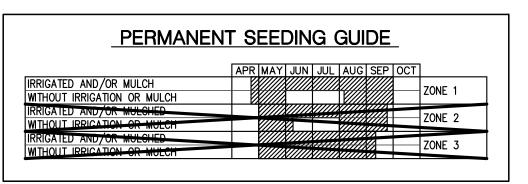
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JOB No: 2300634

MICHIGAN UNIFIED KEYING SYSTEM SOIL EROSION SEDIMENTATION CONTROL MEASURES

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* "	NDICATES APPLICABILITY TO ONE OR MORE OF TH	OF A SPECIFIC CONTROL MEASURE E SEVEN PROBLEM AREAS	SLOPES	STREAMS AND WATERWAYS	SURFACE DRAINAGEWAYS	ENCLOSED DRAINAGE (Inlet & Outfall Control)	LARGE FLAT SURFACE AREAS	Borrow and Stockpile areas	ADJACENT PROPERTIES					SLOPES	STREAMS AND WATERWAYS	SURFACE DRAINAGEWAYS	ENCLOSED DRAINAGE (Inlet & Outfall Control)	LARGE FLAT SURFACE AREAS	Borrow and Stockpile areas	ADJACENT PROPERTIES
KEY	DETAIL	CHARACTERISTICS	Α	В	C	D	Ε	F	G	KE	<u> Y</u>	DETAIL	CHARACTERISTICS	Α	В	C	D	E	F	G
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION. STOCKPILE SHOULD BE TEMPORARILY SEEDED.	*				*	*		28	8	DROP SPILLWAY	SLOWS VELOCITY OF FLOW, REDUCING EROSIVE CAPACITY		*	*				
2	SELECTIVE GRADING & SHAPING	WATER CAN BE DIVERTED TO MINIMIZE EROSION. FLATTER SLOPES EASE EROSION PROBLEMS.	*				*	*	*	29	9	PIPE DROP	REDUCES RUNOFF VELOCITY REMOVES SEDIMENT AND TURBIDITY CAN BE DESIGNED TO HANDLE LARGE VOLUMES OF FLOW			*				
3	GRUBBING OMITTED	SAVES COST OF GRUBBING, PROVIDES NEW SPROUTS, RETAINS EXISTING ROOT MAT SYSTEM, REDUCES WIND FALL AT NEW FOREST EDGE DISCOURAGES EQUIPMENT ENTRANCE	*				*		*	3	0	PIPE SPILLWAY	REMOVES SEDIMENT AND TURBIDITY FROM RUNOFF MAY BE PART OF PERMANENT EROSION CONTROL PLAN			*				
4	VEGETATIVE STABILIZATION	MAY UTILIZE A VARIETY OF PLANT MATERIAL STABILIZES SOIL SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF	*	*	*		*	*	*	3	31	ENERGY DISSIPATER	SLOWS RUNOFF VELOCITY TO NON-EROSIVE LEVEL PERMITS SEDIMENT COLLECTION FROM RUNOFF	*		*	*			
5	SEEDING	INEXPENSIVE AND VERY EFFECTIVE STABILIZES SOIL, THUS MINIMIZING EROSION PERMITS RUNOFF TO INFILTRATE SOIL, REDUCING RUNOFF VOLUME SHOULD INCLUDE PREPARED TOPSOIL BED	*		*		*	*	*	3	2	LEVEL SPREADER	CONVERTS COLLECTED CHANNEL OR PIPE FLOW BACK TO SHEET FLOW AVOIDS CHANNEL EASEMENTS AND CONSTRUCTION OFF PROJECT SITE SIMPLE TO CONSTRUCT			*				
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED	*		*			*	*	33	3	SEDIMENTATION TRAP	MAY BE CONSTRUCTED OF A VARIETY OF MATERIALS TRAPS SEDIMENT AND REDUCES VELOCITY OF FLOW CAN BE CLEANED AND EXPANDED AS NEEDED		*	*				
7	HYDRO-SEEDING	EFFECTIVE ON LARGE AREAS MULCH TACKING AGENT USED TO PROVIDE IMMEDIATE PROTECTION UNTIL GRASS IS ROOTED SHOULD INCLUDE PREPARED TOPSOIL BED	*				*	*	*	34	4	SEDIMENT BASIN	TRAPS SEDIMENT RELEASES RUNOFF AT NON-EROSIVE RATES CONTROLS RUNOFF AT SYSTEM OUTLETS CAN BE VISUAL AMENITIES		*	*	*			
8	SODDING	PROVIDES IMMEDIATE PROTECTION CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH EASY TO PLACE; MAY BE REPAIRED IF DAMAGED SHOULD INCLUDE PREPARED TOPSOIL BED	*		*		*	*	*	3	5	STORM SEWER	SYSTEM REMOVES COLLECTED RUNOFF FROM SITE, PARTICULARLY FROM PAVED AREAS CAN ACCEPT LARGE CONCENTRATIONS OF RUNOFF CONDUCTS RUNOFF TO MUNICIPAL SEWER SYSTEM OR STABILIZED OUTFALL LOCATION USE CATCH BASINS TO COLLECT SEDIMENT					*		*
9	VEGETATIVE BUFFER STRIP	SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF REDUCES VOLUME OF RUNOFF ON SLOPES	*	*					*	3	6	CATCH BASIN, DRAIN INLET	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF MAY USE FILTER CLOTH OVER INLET					*		*
10	MULCHING	USED ALONE TO PROTECT EXPOSED AREAS FOR SHORT PERIODS PROTECTS SOIL FROM IMPACT OF FALLING RAIN PRESERVES SOIL MOISTURE AND PROTECTS GERMINATING SEED FROM TEMPERATURE EXTREMES	*				*	*		3	7	SOD FILTER	INEXPENSIVE AND EASY TO CONSTRUCT PROVIDES IMMEDIATE PROTECTION PROTECTS AREAS AROUND INLETS FROM EROSION				*			
11	ROUGHENED SURFACE	REDUCES VELOCITY AND INCREASES INFILTRATION RATES COLLECTS SEDIMENT HOLDS WATER, SEED, AND MULCH BETTER THAN SMOOTH SURFACES	*				*			38	8	STRAW BALE FILTER	INEXPENSIVE AND EASY TO CONSTRUCT CAN BE LOCATED AS NECESSARY TO COLLECT SEDIMENT MAY BE USED IN CONJUNCTION WITH SNOW FENCE FOR ADDED STABILITY				*			*
12	COMPACTION	HELPS HOLD SOIL IN PLACE, MAKING EXPOSED AREAS LESS VULNERABLE TO EROSION	*				*			3	9	ROCK FILTER	CAN UTILIZE MATERIAL FOUND ON SITE EASY TO CONSTRUCT FILTERS SEDIMENT FROM RUNOFF				*			*
13	RIPRAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS PERMITS RUNOFF TO INFILTRATE SOIL DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS	*	*	*					4	0	INLET SEDIMENT TRAP	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED				*			
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS					*			4	1	STONE AND ROCK CROSSING	MAY BE ROCK OR CLEAN RUBBLE MINIMIZES STREAM TURBIDITY INEXPENSIVE MAY ALSO SERVE AS DITCH CHECK OR SEDIMENT TRAP		*					
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VOLUME AND VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY	*				*			4	2	TEMPORARY CULVERT	ELIMINATES STREAM TURBULENCE AND TURBIDITY PROVIDES UNOBSTRUCTED PASSAGE FOR FISH AND OTHER WATER LIFE CAPACITY FOR NORMAL FLOW CAN BE PROVIDED WITH STORM WATER FLOWING OVER ROADWAY		*					
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY					*		*	4	3	CULVERT SEDIMENT TRAP	EASY TO INSTALL AT INLET KEEPS CULVERT CLEAN AND FREE FLOWING MAY BE CONSTRUCTED OF LUMBER OR LOGS		*					*
17	BENCHES	REDUCES RUNOFF VELOCITY BY REDUCING EFFECTIVE SLOPE LENGTH COLLECTS SEDIMENT PROVIDES ACCESS TO SLOPES FOR SEEDING, MULCHING AND MAINTENANCE	*					*		4	4	CULVERT SEDIMENT TRAP	DEFLECTS CURRENTS AWAY FROM STREAMBANK AREAS		*					
18	DIVERSION BERM	DIVERTS WATER FROM VULNERABLE AREAS COLLECTS AND DIRECTS WATER TO PREPARED DRAINAGEWAYS MAY BE PLACED AS PART OF NORMAL CONSTRUCTION OPERATION	*					*	*	4	5	TEMP. STREAM CHANNEL CHANGE	NEW CHANNEL KEEPS NORMAL FLOWS AWAY FROM CONSTRUCTION REQUIRES STATE PERMIT		*					
19	DIVERSION DITCH	COLLECTS AND DIVERTS WATER TO REDUCE EROSION POTENTIAL MAY BE INCORPORATED IN PERMANENT PROJECT DRAINAGE SYSTEMS	*					*	*	4	6	SHEET PILINGS	PROTECTS ERODIBLE BANK AREAS FROM STREAM CURRENTS DURING CONSTRUCTION MINIMAL DISRUPTION WHEN REMOVED		*					
20	BERM & DITCH	DIVERTS WATER TO A PREPARED DRAINAGEWAY MAY BE USED AT INTERVALS ACROSS SLOPE FACE TO REDUCE EFFECTIVE SLOPE LENGTH	*					*	*	4	7	COFFERDAM	WORK CAN BE CONTINUED DURING MOST ANTICIPATED STREAM CONDITIONS CLEAR WATER CAN BE PUMPED DIRECTLY BACK INTO STREAM		*					
21	FILTER BERM	CONSTRUCTED OF GRAVEL OR STONE INTERCEPTS AND DIVERTS RUNOFF TO STABILIZED AREAS OR PREPARED DRAINAGE SYSTEMS SLOWS RUNOFF AND COLLECTS SEDIMENT	*	*					*	48	8	CONSTRUCTION DAM	PERMITS WORK TO CONTINUE DURING NORMAL STREAM STAGES CONTROLLED FLOODING CAN BE ACCOMPLISHED DURING PERIODS OF INACTIVITY		*					
22	BRUSH FILTER	USES SLASH AND LOGS FROM CLEARING OPERATIONS CAN BE COVERED AND SEEDED RATHER THAN REMOVED ELIMINATES NEED FOR BURNING OR REMOVAL OF MATERIAL FROM SITE							*	49	9	CHECK DAMS	REDUCES FLOW VELOCITY CATCHES SEDIMENT CAN BE CONSTRUCTED OF LOGS, STRAW, HAY ROCK, LUMBER, MASONRY, OR SAND BAGS		*	*				
23	BARE CHANNEL	LEAST EXPENSIVE FORM OF DRAINAGEWAY MAY BE USED ONLY WHERE GRADIENT IS VERY LOW AND WITH SOILS OF MINIMUM EROSION POTENTIAL			*					5	0	WEIR	CONTROLS SEDIMENTATION IN LARGE STREAMS CAUSES MINIMAL TURBIDITY		*	*				
24	GRASSED WATERWAY	MUCH MORE STABLE FORM OF DRAINAGEWAY THAN BARE CHANNEL GRASS TENDS TO SLOW RUNOFF AND FILTER OUT SEDIMENT USED WHERE BARE CHANNEL WOULD BE ERODED			*					5	51	RETAINING WALL	REDUCES GRADIENT WHERE SLOPES ARE EXTREMELY STEEP PERMITS RETENTION OF EXISTING VEGETATION, KEEPING SOIL STABLE IN CRITICAL AREAS MINIMIZES MAINTENANCE	*						*
25	SLOPE DRAIN (SURFACE PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES	*							5	2	SEEPAGE CONTROL	PREVENTS PIPING AND SOIL SLIPPAGE ON CUT SLOPES	*						*
26	SLOPE DRAIN (PIPE CHUTE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES	*							5	3	WINDBREAK	MINIMIZES WIND EROSION MAY BE SNOW FENCE					*		
27	SLOPE DRAIN (SUBSURFACE PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED AS GRADING PROGRESSES	*							54	4	SILT FENCE	USES GEOTEXTILE FABRIC AND POSTS OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY.			*				*





SOIL EROSION & SEDIMENTATION CONTROL

CONTRACTOR SHALL SUBMIT A DETAILED EROSION CONTROL PLAN AND OBTAIN A SOIL EROSION & SEDIMENTATION CONTROL PERMIT PRIOR TO ANY EARTH CHANGES.
 CONSTRUCTION OPERATION SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING AND/OR GRADING OPERATIONS.

BORROW AND FILL DISPOSAL AREAS WILL BE SELECTED AND APPROVED AT TIME OF PLAN REVIEW.

SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.

CLEANUP WILL BE DONE IN A MANNER TO ENSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.

THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL

THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE DEVELOPER WITHIN 24 HOURS. TEMPORARY EROSION CONTROL MEASURES SHALL BE COMPLETELY REMOVED BY THE DEVELOPER UPON ESTABLISHMENT OF PERMANENT CONTROL MEASURES.

ALL TEMPORARY SOIL EROSION CONTROL MEASURES MUST BE REMOVED FROM ROAD RIGHT—OF—WAY AREAS PRIOR TO ACCEPTANCE OF STREETS FOR ROUTINE MAINTENANCE.

VEGETATION MUST BE ACCEPTABLY ESTABLISHED PRIOR TO FINAL RELEASE OF THE CONSTRUCTION GUARANTEE BY THE DESIGNATED SOIL EROSION SEDIMENTATION CONTROL AGENT.

<u>IAINTENANCE</u>	RESPONSIBLE PARTY	ANNUAL COST
VEGETATION IS BEING ESTABLISHED, HAND WEEDING OR OTHER CONTROL METHODS WILL BE REQUIRED. THEREAFTER, TWICE	CITY PARKS DEPT.	\$ 100
AL WEEDING IS TYPICAL INVASIVE PLANTS SHOULD BE		

2. FALL AND SPRING CLEANUP MUST BE PERFORMED INCLUDING CUTTING CITY PARKS DEPT. \$100 DOWN DEAD PERENNIALS, REMOVAL OF WEEDS AND REMOVAL OR MULCHING OF LEAVES AND STEMS. 3. MULCH MUST BE RE-SPREAD WHEN EROSION IS EVIDENT AND BE CITY PARKS DEPT. REPLENISHED ANNUALLY. ONCE EVERY 2 TO 3 YEARS THE ENTIRE AREA MAY REQUIRE MULCH REPLACEMENT. 4. BIORETENTION SYSTEMS MUST BE INSPECTED FOLLOWING STORM CITY PARKS DEPT. EVENTS OF 1 INCH OR MORE AND AT LEAST TWO TIMES PER YEAR FOR SEDIMENT BUILDUP, EROSION, VEGETATIVE CONDITIONS, ETC. SEDIMENT MUST BE REMOVED FROM FOREBAY AND RIPRAP/STONE PROTECTED AREAS AT LEAST TWICE PER YEAR. SEDIMENT SHOULD BE REMOVED BEFORE ITS ACCUMULATION NEGATIVELY IMPACTS THE PERFORMANCE OF THE PRETREATMENT DEVICE. 5. DURING PERIODS OF EXTREME DROUGHT, BIORETENTION SYSTEMS MAY CITY PARKS DEPT.

CITY PARKS DEPT.

CITY PARKS DEPT. \$500

BIORETENTION SYSTEMS CAN BE MOWED TWICE PER YEAR.
 TREES AND SHRUBS MUST BE INSPECTED TWICE PER YEAR TO EVALUATE HEALTH.
 INVASIVE SPECIES MUST BE REMOVED ON AN ANNUAL BASIS AND DISPOSED OF IN COMPLIANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. NO CHEMICAL SHALL BE USED WITH ONE EXCEPTION. INVASIVE SPECIES CAN BE TREATED CHEMICALLY BY A CERTIFIED APPLICATOR.

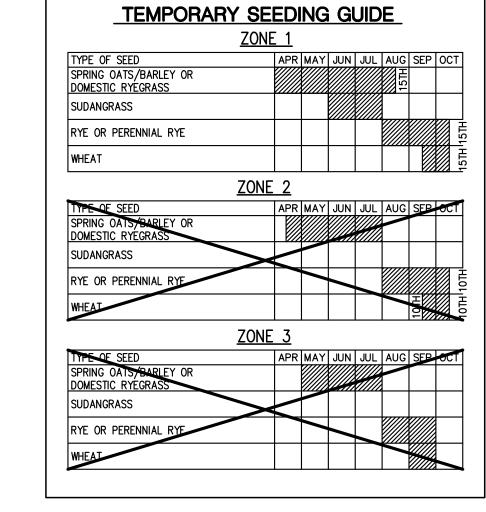
CONTROLLED EARLY IN THEIR ESTABLISHMENT BEFORE THEY SPREAD.

APPLICATOR.

9. THE LONG-TERM WATER MAINTENANCE PLAN FOR THE FACILITY CITY PARKS DEPT. TOTAL: \$1,300 INCLUDES OVERSIGHT BY THE CITY OF ANN ARBOR PARKS AND RECREATION COMMISSION WITH AN ANNUAL STAFFING BUDGET OF OVER \$5.5 MILLION DOLLARS CITY-WIDE. THE CONTACT FOR THIS FACILITY IS ADAM FERCHO, PARK PLANNER AND LANDSCAPE ARCHITECT (734) 794-6230 EXT. 42549.

ADAM FERCHO, PARK PLANNER AND LANDSCAPE ARCHITECT (734) 794—6230 EXT. 42549.

10. WCWRC WILL BE NOTIFIED UPON RECEIPT OF VEGETATIVE MATERIALS FOR THE RETENTION POND FOR INSPECTION AND REVIEW PRIOR TO INSTALLATION.



SOIL EROSION/SEDIMENTATION CONTROL OPERATION TIME SCHEDULE												
CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ	NOV	DEC
STRIP & STOCKPILE TOPSOIL												
ROUGH GRADE SEDIMENT CONTROL												
TEMP. CONTROL MEASURES												
STORM FACILITIES												
TEMP. CONSTRUCTION ROADS												
SITE CONSTRUCTION												
PERM. CONTROL MEASURES												
FINISH GRADING												

CONSTRUCTION SEQUENCE

- IMPLEMENTATION OF TEMPORARY EROSION CONTROL MEASURES; SELECTIVE GRADING, DIVERSIONS AS REQUIRED IN FIELD, PROTECTION OF STORM SEWER FACILITIES.
 EXCAVATION AND STOCKPILING OF SOIL.

 PERIODIC MAINTENANCE OF AFFECTED EROSION CONTROL MEASURES.
- EXCAVATION AND STOCKPILING OF SOIL.
 PERIODIC MAINTENANCE OF AFFECTED EROSION CONTROL MEASURES.
 PERMANENT MEASURES; FINAL GRADING, SEEDING AND MULCHING.

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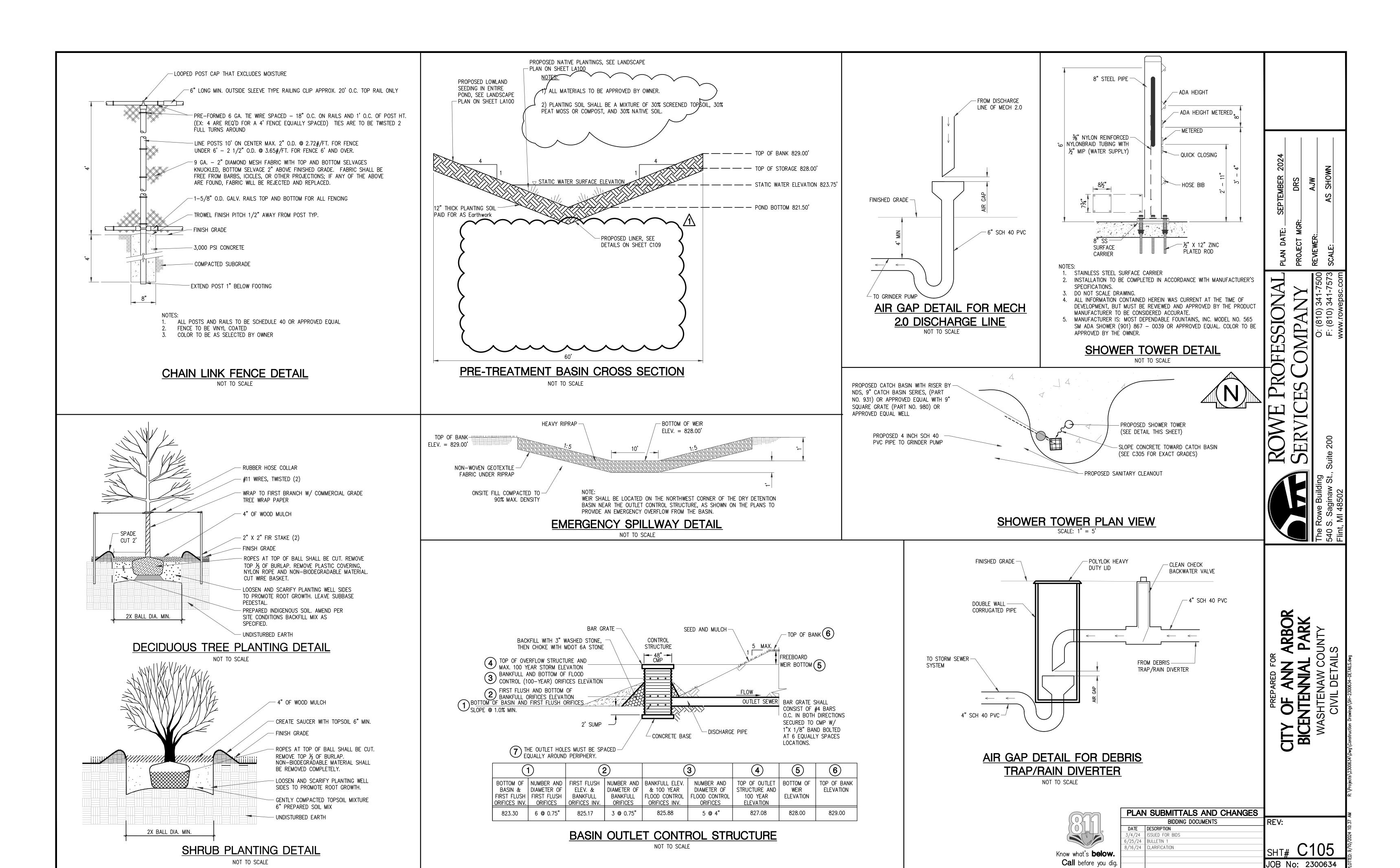
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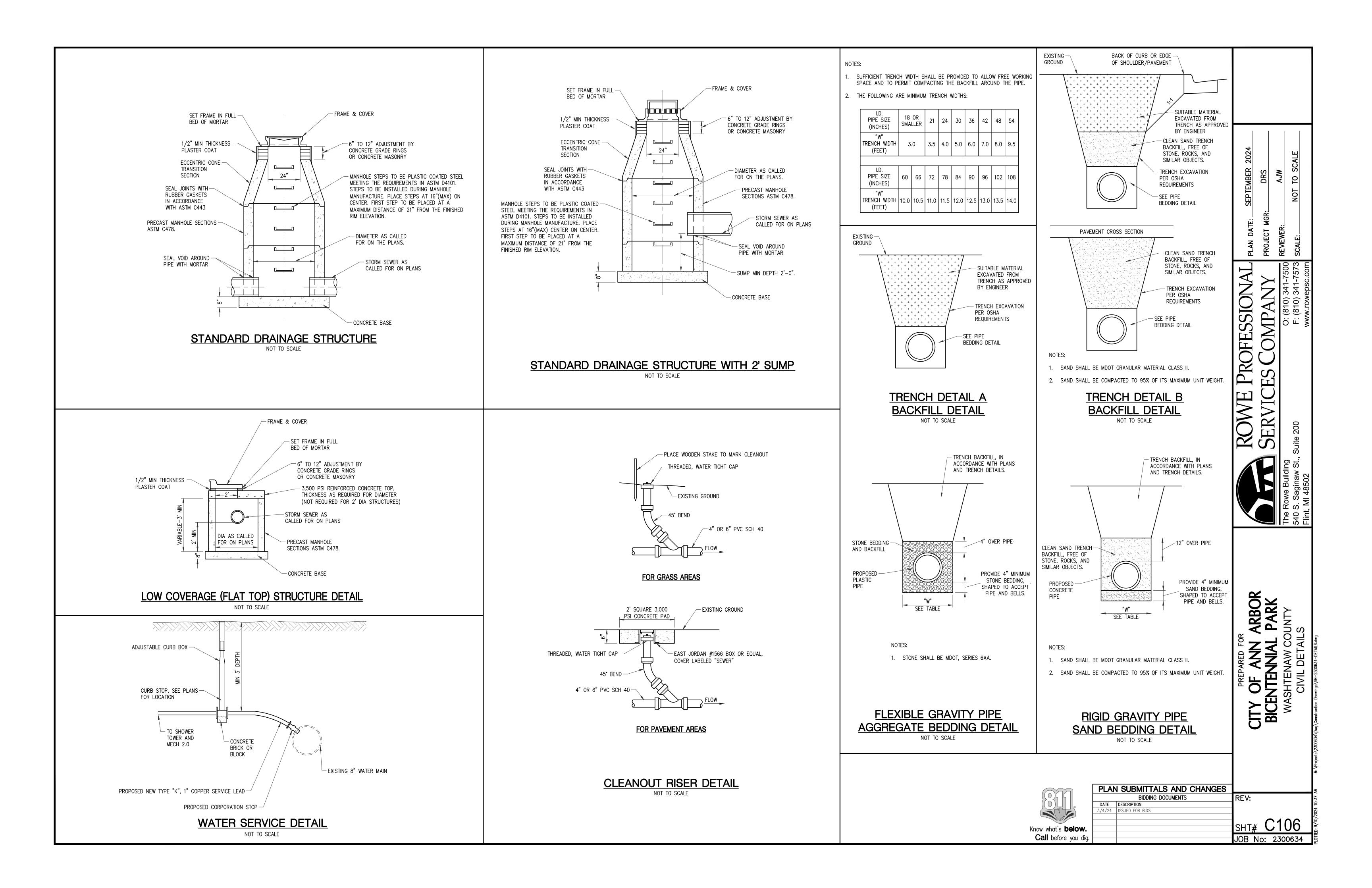
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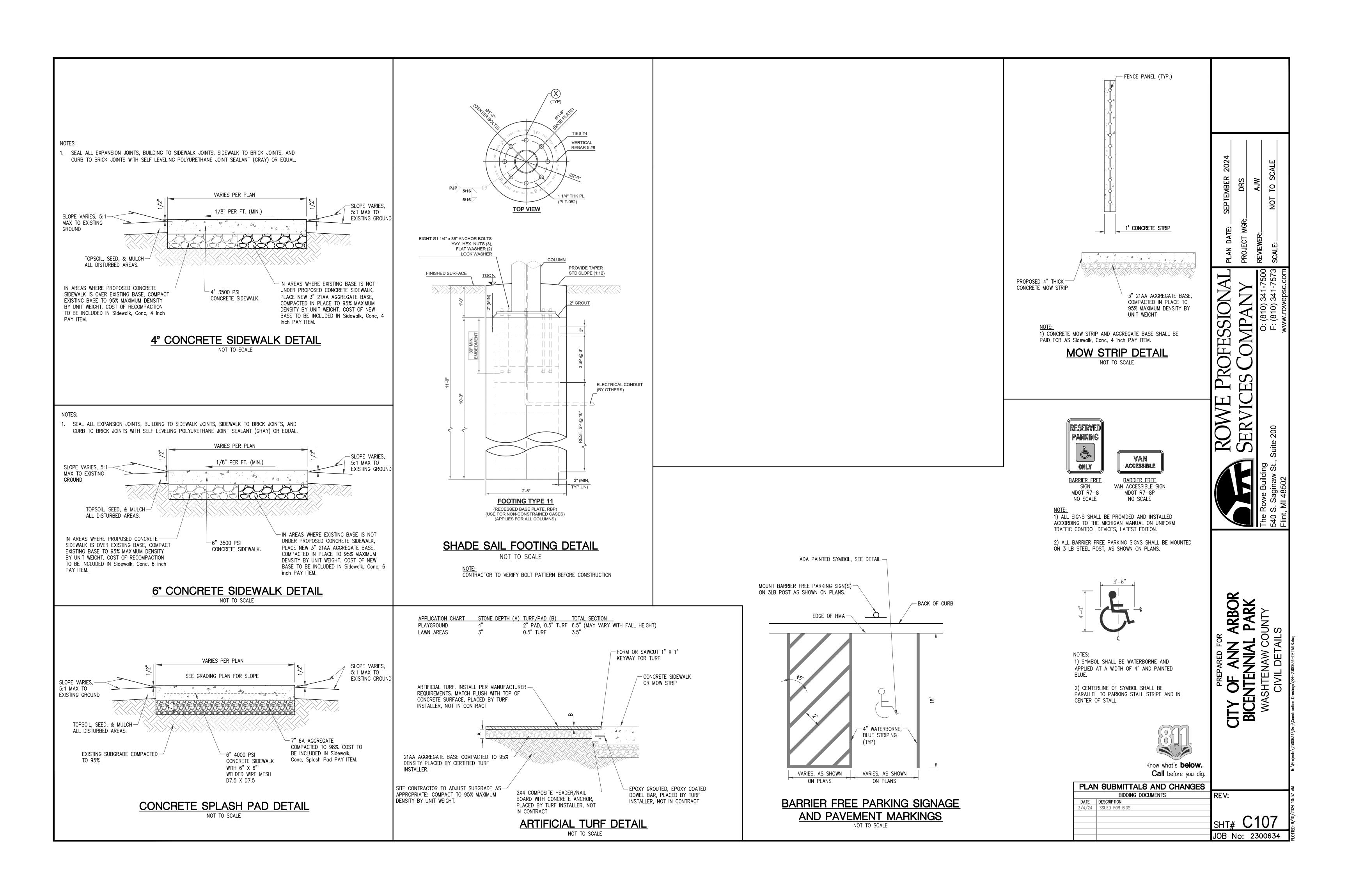
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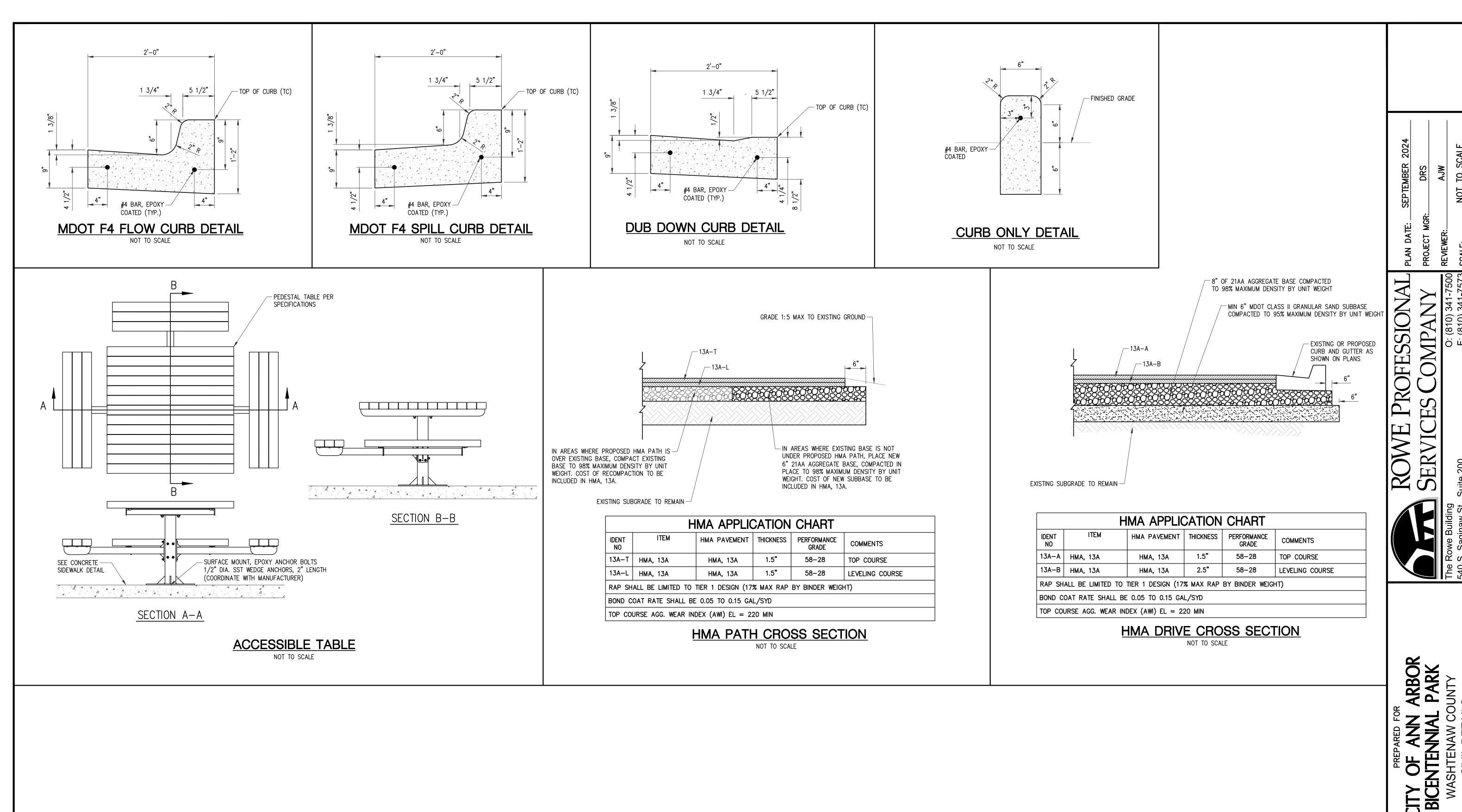
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PLAN SUBMITTALS AND CHANGES

BIDDING DOCUMENTS

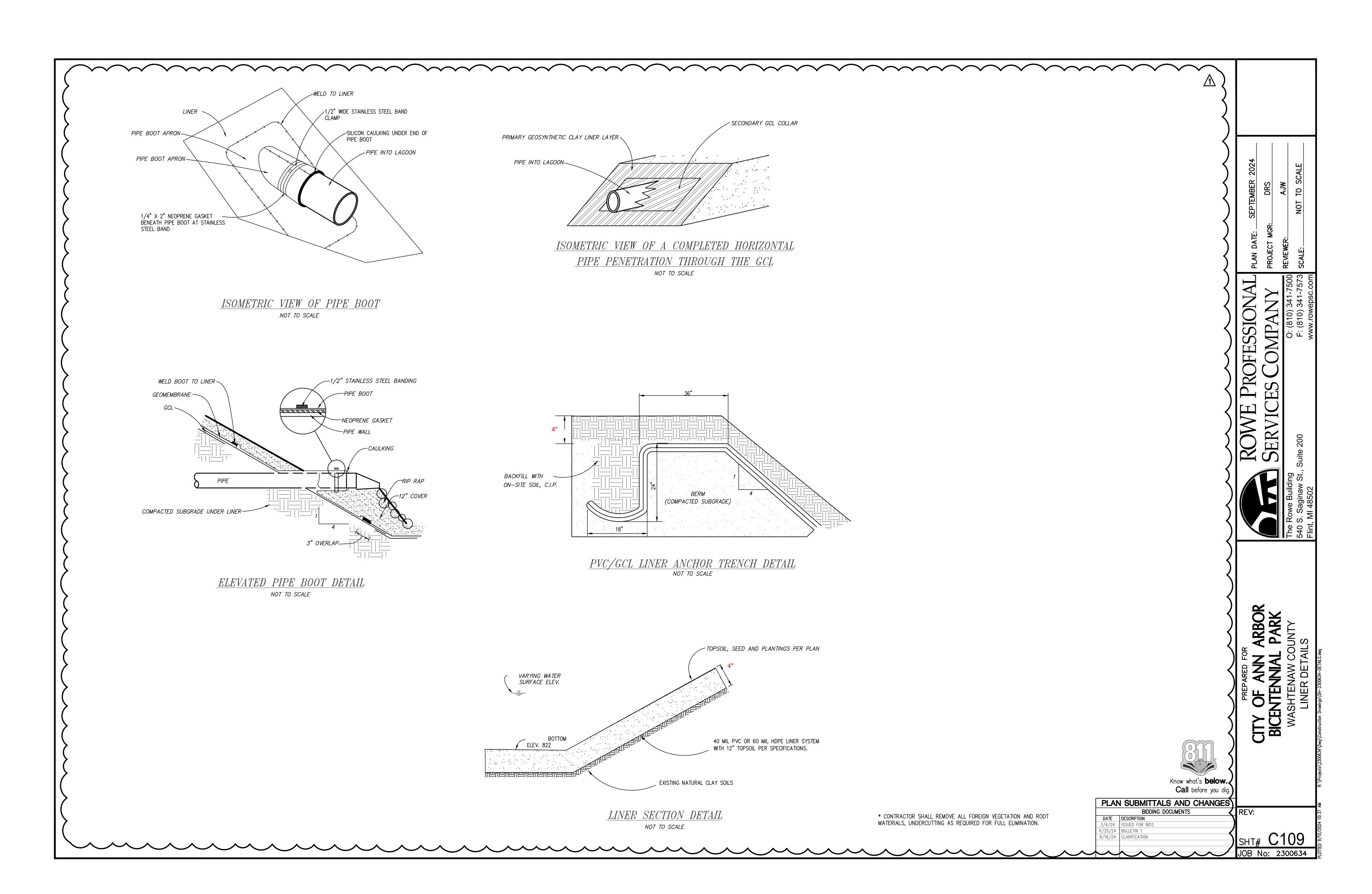
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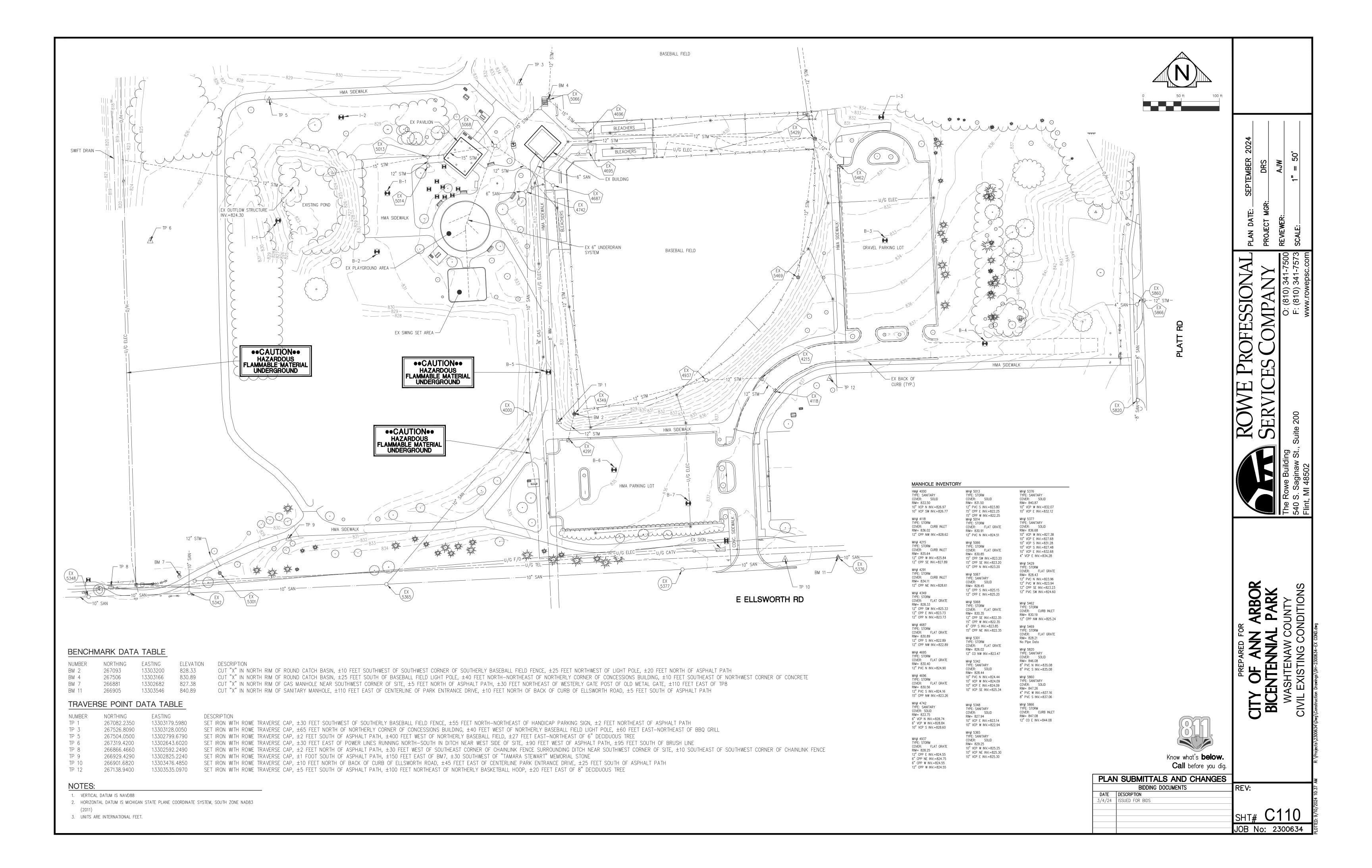
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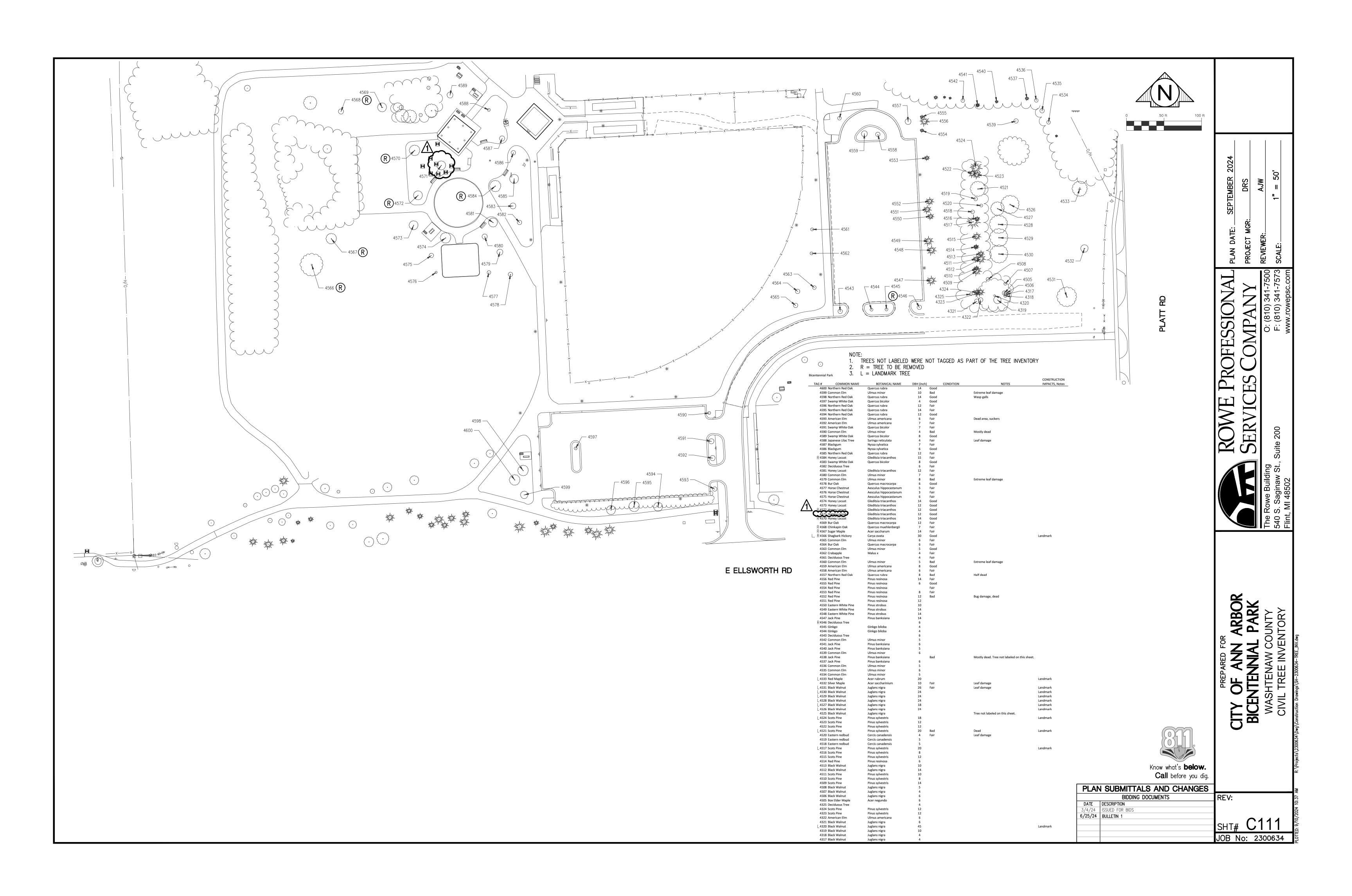
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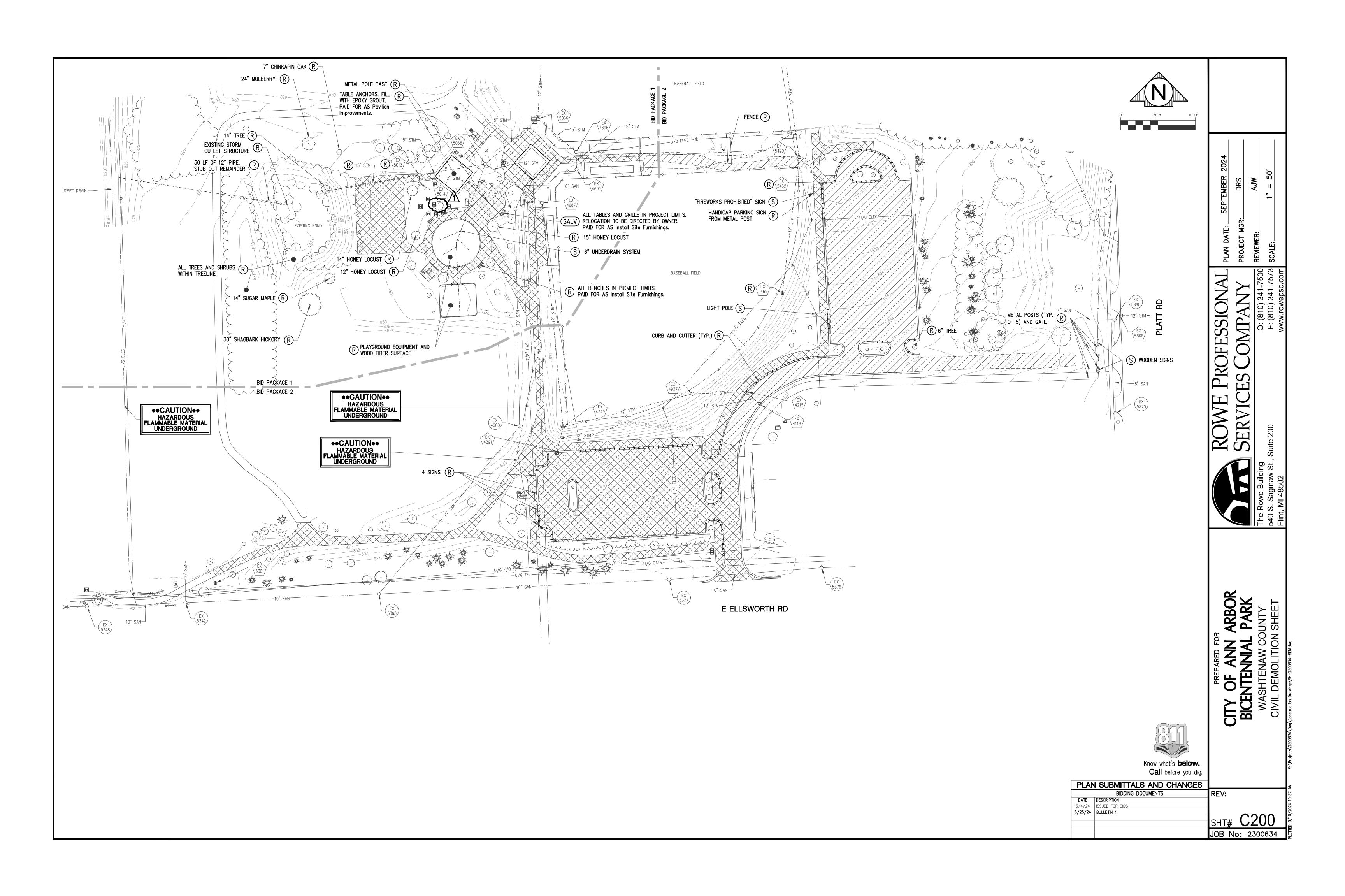
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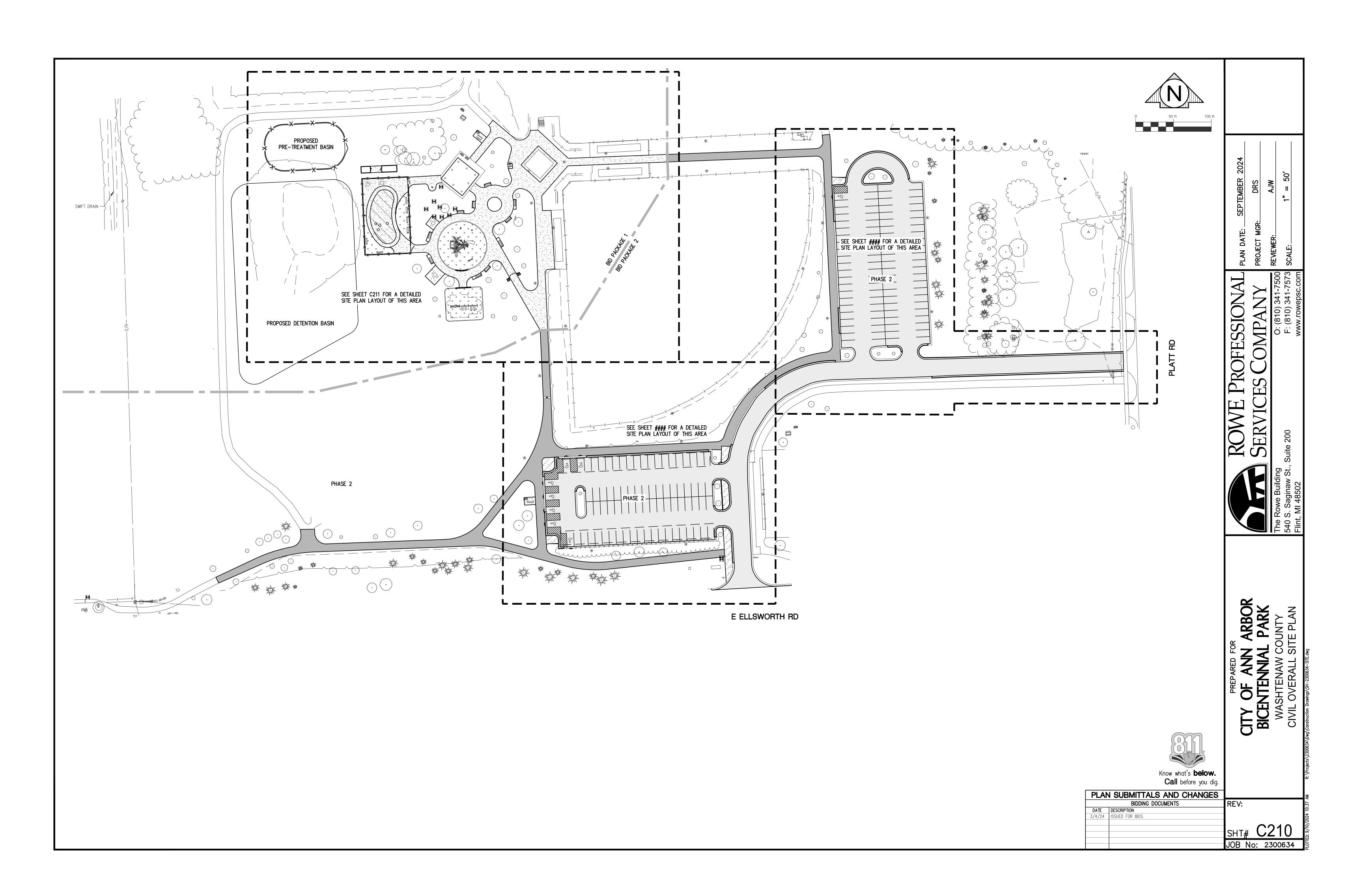
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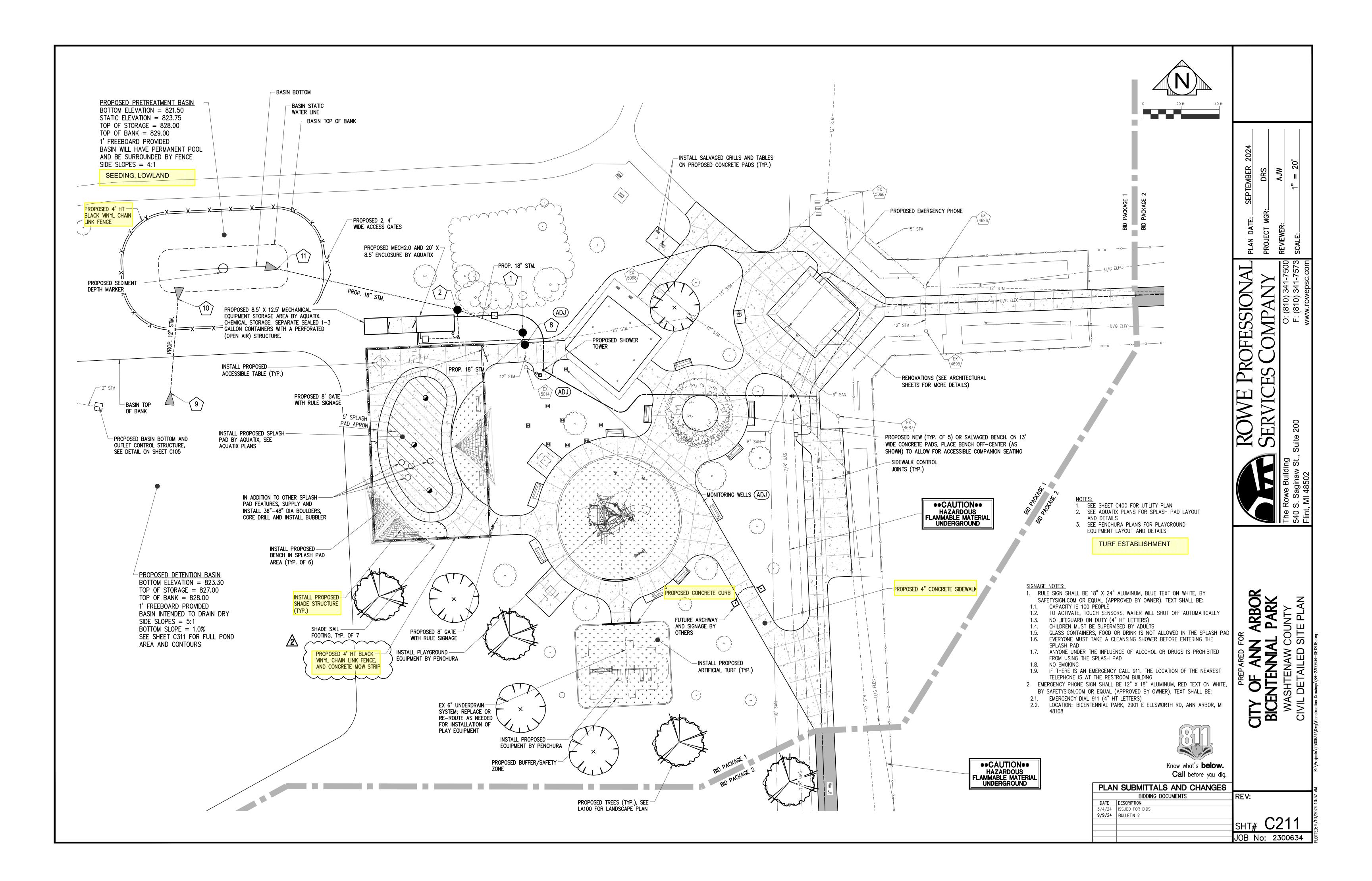


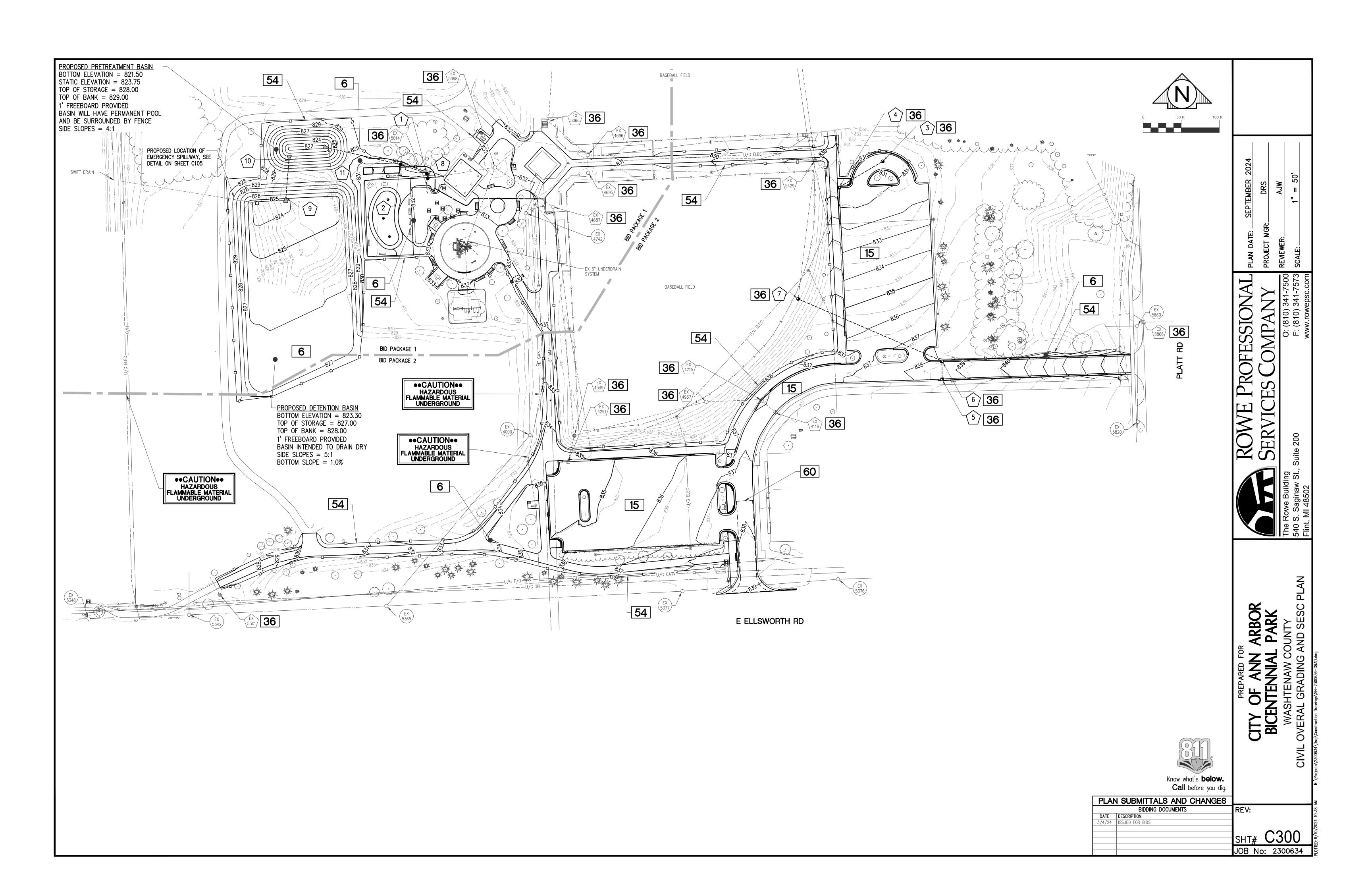


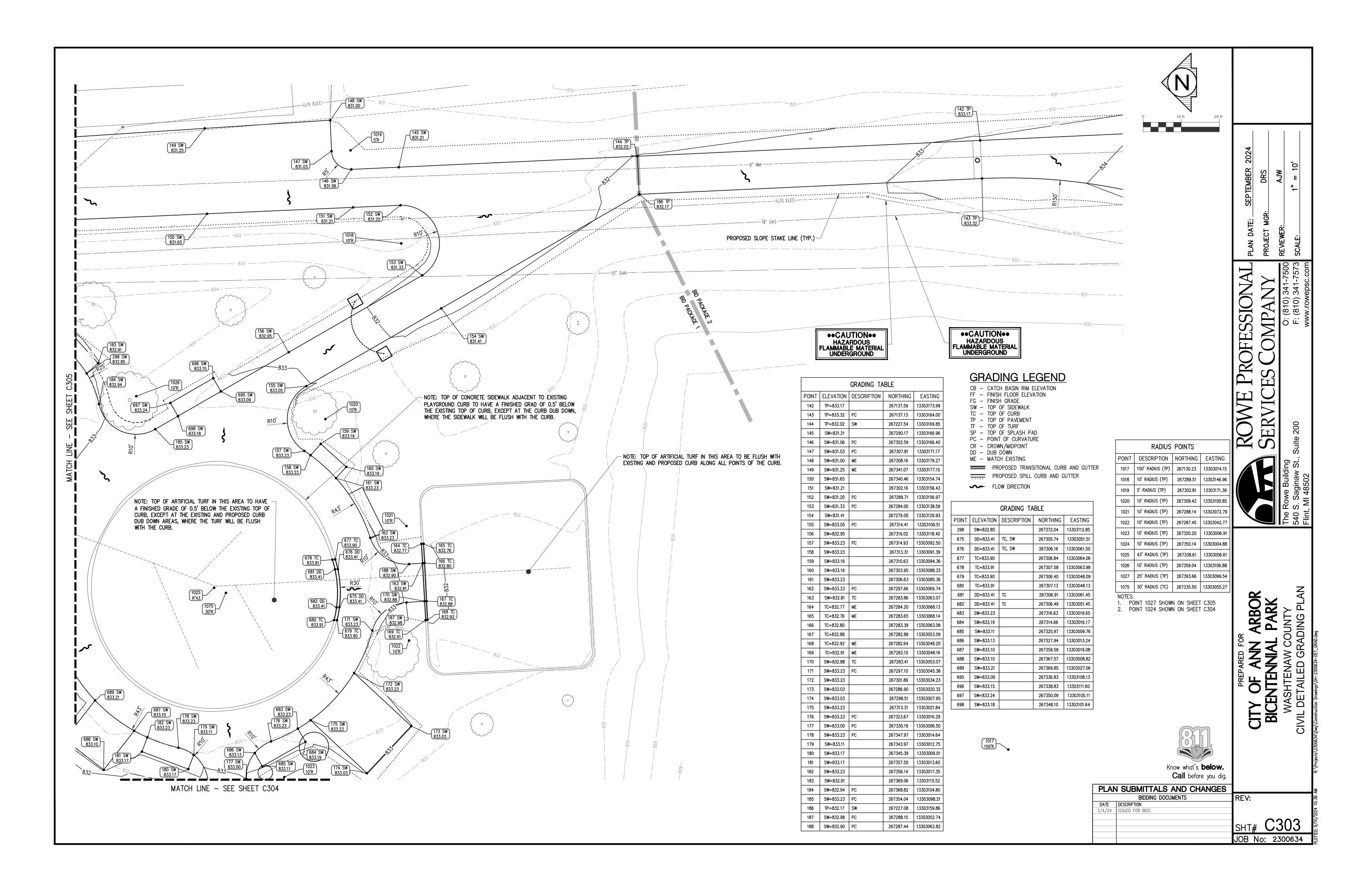


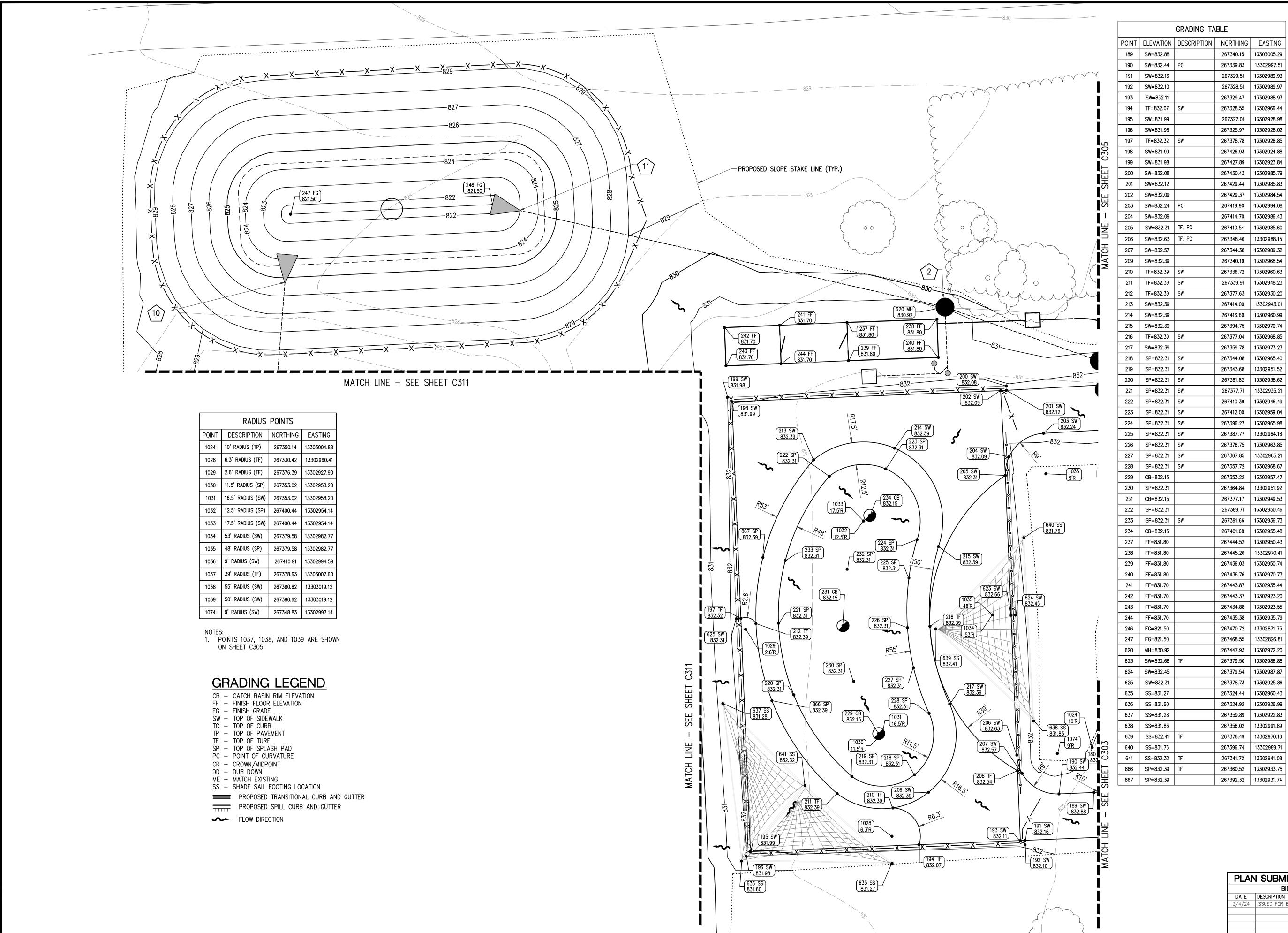


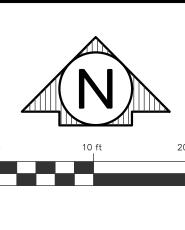












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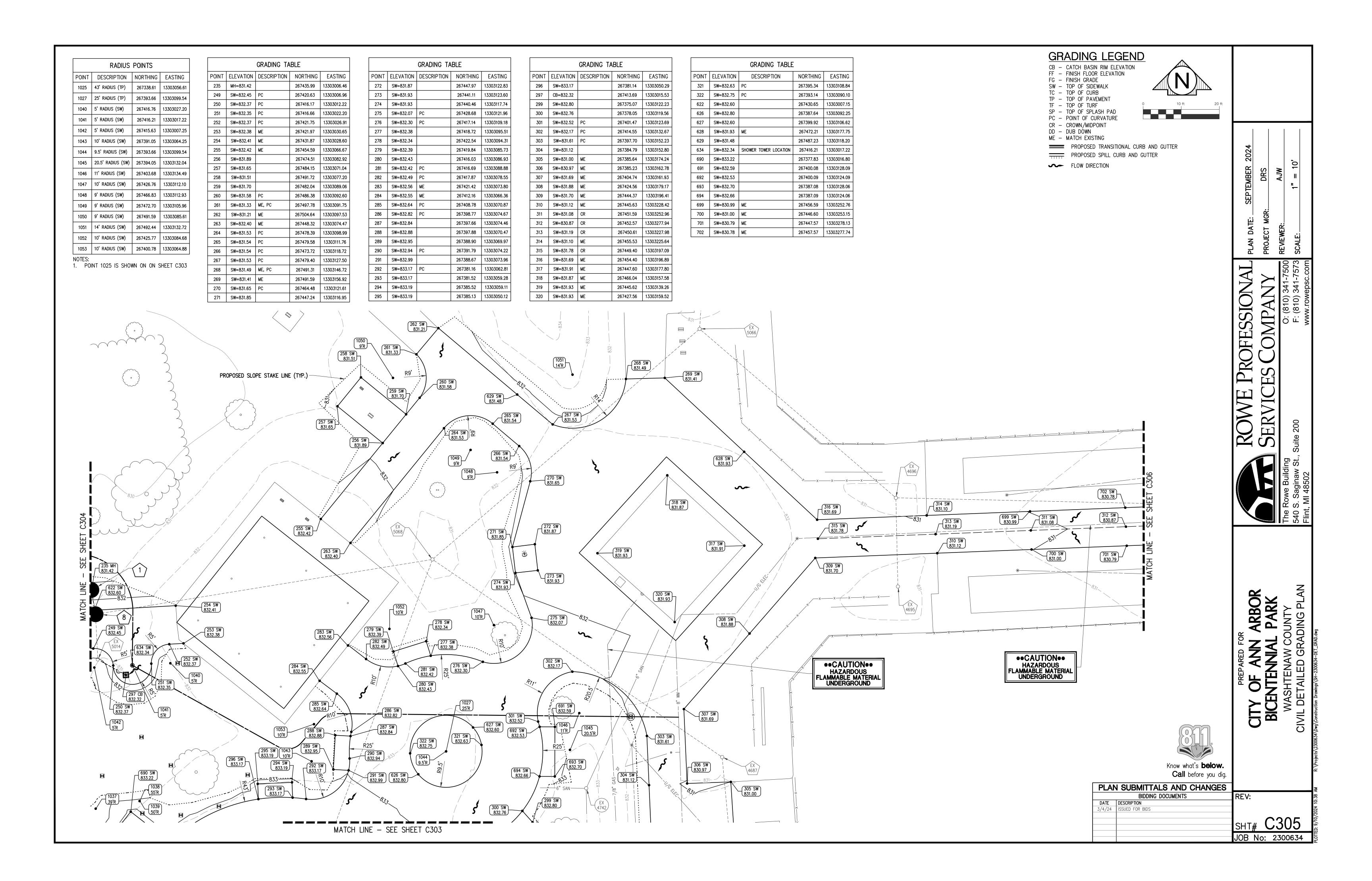
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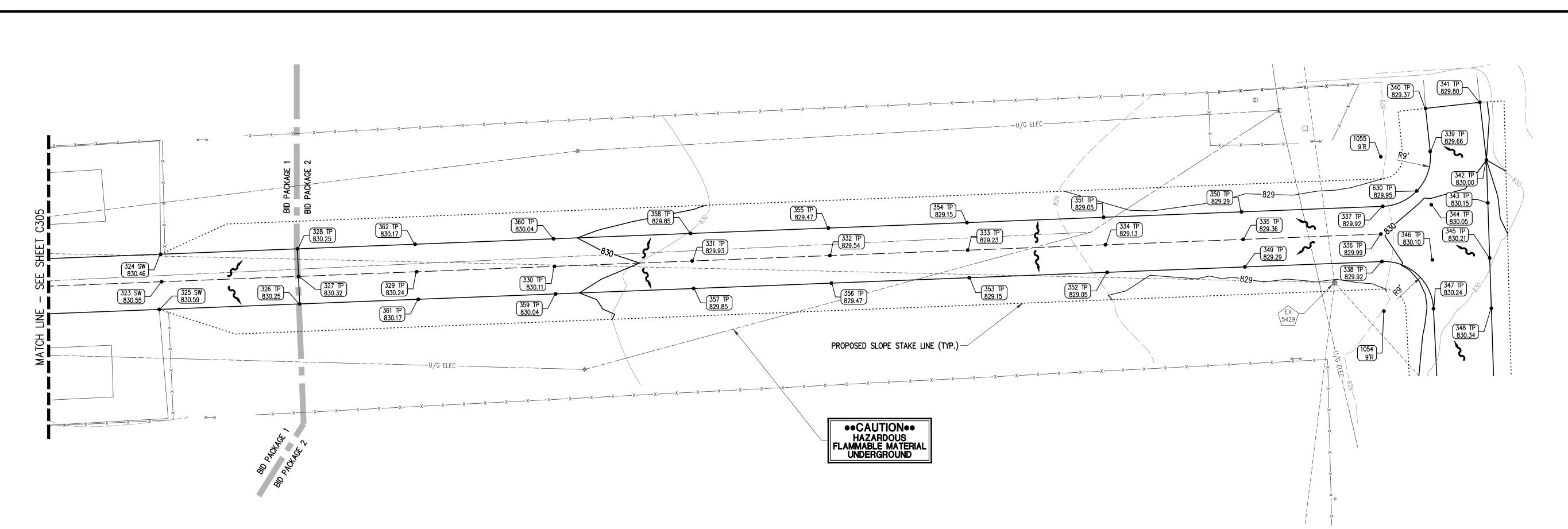
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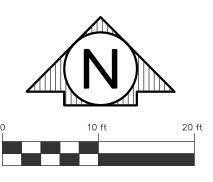
ARBOR PARK CITY OF ANN A
BICENTENNIAL
WASHTENAW COL
CIVIL DETAILED GRAD

Know what's **below.** Call before you dig.

PLAN SUBMITTALS AND CHANGES BIDDING DOCUMENTS REV: DATE DESCRIPTION
3/4/24 ISSUED FOR BIDS sнт# **C304** JOB No: 2300634







DATE

COMPA

ROWE SERVIC

GRADING TABLE									
POINT	ELEVATION	DESCRIPTION	NORTHING	EASTING					
323	SW=830.55	CR	267453.55	13303303.08					
324	SW=830.46	ME	267458.55	13303302.88					
325	SW=830.59	ME	267448.53	13303302.64					
326	TP=830.25	SW	267449.53	13303328.10					
327	TP=830.32	CR	267454.53	13303327.90					
328	TP=830.25	SW	267459.52	13303327.70					
329	TP=830.24	CR	267455.37	13303349.33					
330	TP=830.11	CR	267456.34	13303374.31					
331	TP=829.93	CR	267457.32	13303399.29					
332	TP=829.54	CR	267458.30	13303424.27					
333	TP=829.23	CR	267459.28	13303449.25					
334	TP=829.13	CR	267460.26	13303474.23					
335	TP=829.36	CR	267461.24	13303499.21					
336	TP=829.99	CR	267462.21	13303524.19					
337	TP=829.92	PC	267467.23	13303524.53					
338	TP=829.92	PC	267457.22	13303524.39					
339	TP=829.66	PC	267477.18	13303533.13					
340	TP=829.37	ME	267484.98	13303532.29					
341	TP=829.80	ME	267486.10	13303542.16					
342	TP=830.00		267475.64	13303543.33					

267467.86 13303543.59

267467.52 13303533.33 267457.87 | 13303543.92

267457.52 13303533.54

267448.67 | 13303533.73

267448.74 | 13303544.23

267456.25 | 13303499.51

267466.23 13303498.91

267454.29 13303449.53

267464.28 13303449.14

267463.29 | 13303424.00

267453.31 13303424.54

267452.33 13303399.56

267462.32 | 13303399.02

267451.35 | 13303374.54

267461.34 13303374.15

267450.37 | 13303349.62

267460.36 13303349.03

267470.03 13303530.71

343 TP=830.15

344 TP=830.05

345 TP=830.21 346 TP=830.10

348 TP=830.34

349 TP=829.29

350 TP=829.29

353 TP=829.15

354 TP=829.15

355 TP=829.47

356 TP=829.47

357 TP=829.85

358 TP=829.85

359 TP=830.04

360 TP=830.04

361 TP=830.17

362 TP=830.17

630 TP=829.95

347 | TP=830.24 | PC

RADIUS POINTS								
POINT	DESCRIPTION	NORTHING	EASTING					
1054	9' RADIUS (TP)	267448.23	13303524.74					
1055	9' RADIUS (TP)	267476.22	13303524.18					

GRADING LEGEND

CB — CATCH BASIN RIM ELEVATION FF — FINISH FLOOR ELEVATION

FG - FINISH GRADE

SW - TOP OF SIDEWALK

TC - TOP OF CURB

TP - TOP OF PAVEMENT TF - TOP OF TURF

SP - TOP OF SPLASH PAD PC - POINT OF CURVATURE

CR - CROWN/MIDPOINT DD - DUB DOWN

ME - MATCH EXISTING

PROPOSED TRANSITIONAL CURB AND GUTTER PROPOSED SPILL CURB AND GUTTER

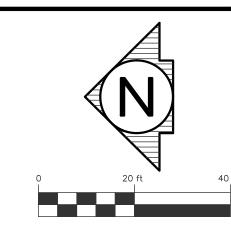
FLOW DIRECTION



Know what's **below. Call** before you dig.

PLAN SUBMITTALS AND CHANGES BIDDING DOCUMENTS REV: DATE DESCRIPTION
3/4/24 ISSUED FOR BIDS sнт# **C306** JOB No: 2300634

ARBOR PARK CITY OF ANN ARBO BICENTENNIAL PARK WASHTENAW COUNTY CIVIL DETAILED GRADING PL





FLOW DIRECTION

PROPOSED SLOPE STAKE LINE (TYP.)

666 FG 827.00

~~

669 FG 827.00

660 FG 826.13

~

661 FG 826.10

MATCH LINE - SEE SHEET C304

PROPOSED BASIN BOTTOM AND OUTLET CONTROL STRUCTURE, SEE DETAIL ON SHEET C105

651 FG 825.00

643 FG 824.00

649 FG 823.31

PROPOSED DETENTION BASIN

BOTTOM ELEVATION = 823.30 TOP OF STORAGE = 827.00 TOP OF BANK = 828.00

1' FREEBOARD PROVIDED
BASIN INTENDED TO DRAIN DRY
SIDE SLOPES = 5:1
BOTTOM SLOPE = 1.0%

PROPOSED LOCATION OF —— EMERGENCY SPILLWAY, SEE DETAIL ON SHEET C105

GRADING TABLE									
POINT	ELEVATION	DESCRIPTION	NORTHING	EASTING					
642	FG=824.00		267385.77	13302825.4					
643	FG=824.00		267398.98	13302827.2					
644	FG=824.00		267367.90	13302787.8					
645	FG=824.00		267373.19	13302779.0					
646	FG=824.00		267396.71	13302777.7					
647	FG=824.00		267398.86	13302779.6					
648	FG=824.00		267400.94	13302825.0					
649	FG=823.31		267397.08	13302783.4					
651	FG=825.00		267367.46	13302883.9					
652	FG=825.00		267381.76	13302892.5					
653	FG=825.00		267401.60	13302891.6					
654	FG=825.00		267406.36	13302886.3					
655	FG=825.00		267401.04	13302776.5					
656	FG=825.00		267395.80	13302771.7					
658	FG=826.24		267260.32	13302891.0					
659	FG=826.10		267279.40	13302902.5					
660	FG=826.13		267218.98	13302802.9					
661	FG=826.10		267236.12	13302774.4					
662	FG=826.00		267395.56	13302766.7					
663	FG=826.00		267406.03	13302776.2					
664	FG=826.00		267411.35	13302886.1					
665	FG=826.00		267401.85	13302896.6					
666	FG=827.00		267150.54	13302801.2					
667	FG=827.00		267197.51	13302900.8					
668	FG=827.00		267215.56	13302910.6					
669	FG=827.00		267167.68	13302772.7					
670	FG=827.00		267395.32	13302761.7					
671	FG=827.00		267411.03	13302776.0					
672	FG=827.00		267416.35	13302885.9					
673	FG=827.00		267402.09	13302901.6					
674	FG=824.00		267391.14	13302827.6					

POINT	ELEVATION	DESCRIPTION	NORTHING	EASTING
642	FG=824.00		267385.77	13302825.41
643	FG=824.00		267398.98	13302827.23
644	FG=824.00		267367.90	13302787.80
645	FG=824.00		267373.19	13302779.01
646	FG=824.00		267396.71	13302777.70
647	FG=824.00		267398.86	13302779.66
648	FG=824.00		267400.94	13302825.07
649	FG=823.31		267397.08	13302783.47
651	FG=825.00		267367.46	13302883.97
652	FG=825.00		267381.76	13302892.58
653	FG=825.00		267401.60	13302891.62
654	FG=825.00		267406.36	13302886.38
655	FG=825.00		267401.04	13302776.51
656	FG=825.00		267395.80	13302771.76
658	FG=826.24		267260.32	13302891.06
659	FG=826.10		267279.40	13302902.54
660	FG=826.13		267218.98	13302802.96
661	FG=826.10		267236.12	13302774.49
662	FG=826.00		267395.56	13302766.77
663	FG=826.00		267406.03	13302776.27
664	FG=826.00		267411.35	13302886.14
665	FG=826.00		267401.85	13302896.61
666	FG=827.00		267150.54	13302801.27
667	FG=827.00		267197.51	13302900.87
668	FG=827.00		267215.56	13302910.64
669	FG=827.00		267167.68	13302772.79
670	FG=827.00		267395.32	13302761.77
671	FG=827.00		267411.03	13302776.03
672	FG=827.00		267416.35	13302885.90
673	FG=827.00		267402.09	13302901.61
674	FG=824.00		267391.14	13302827.61

Know what's **below.** Call before you dig.

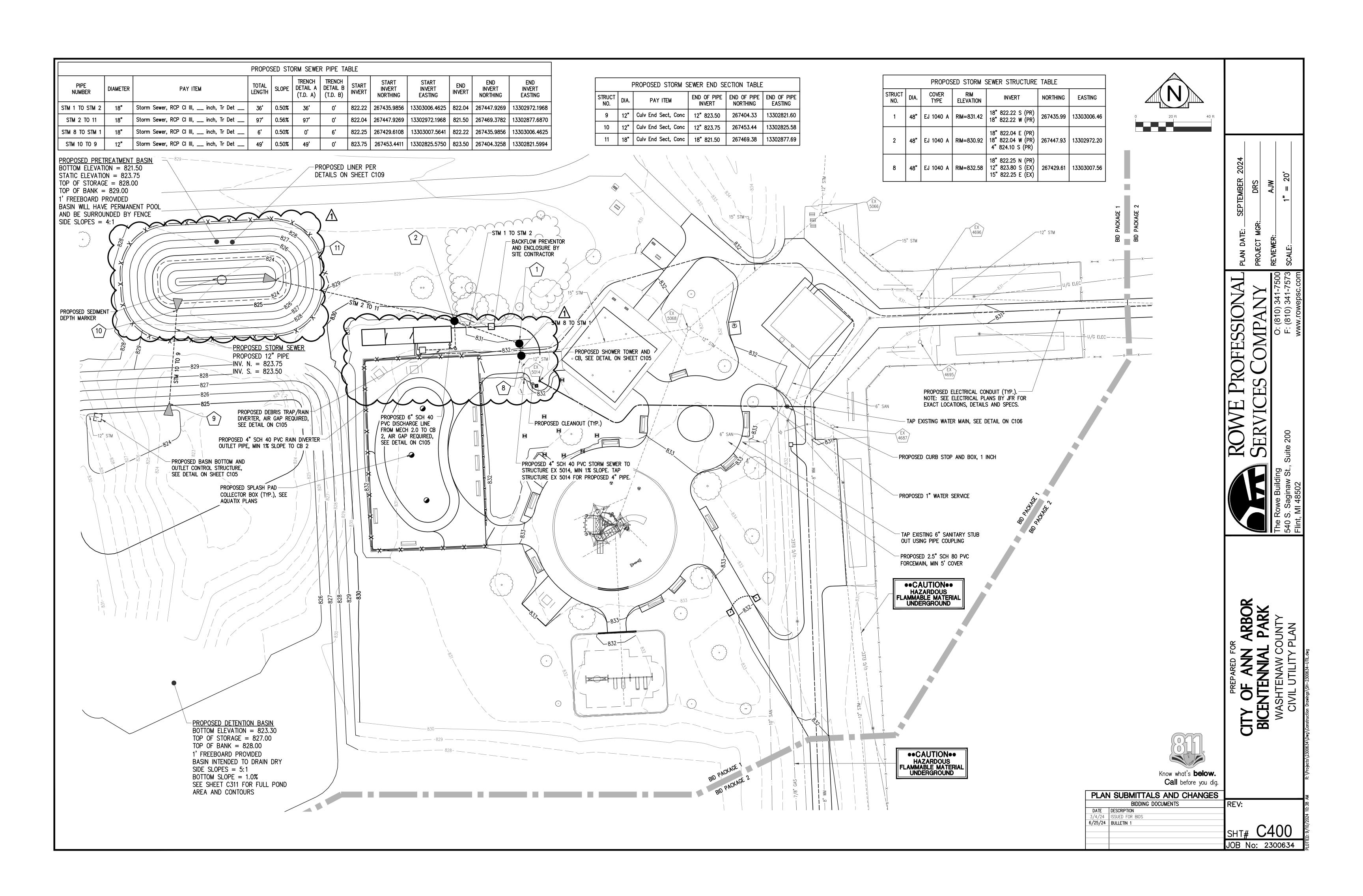
PLAN SUBMITTALS AND CHANGES BIDDING DOCUMENTS

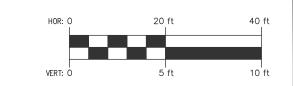
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3/4/24 ISSUED FOR BIDS
9/9/24 BULLETIN 2

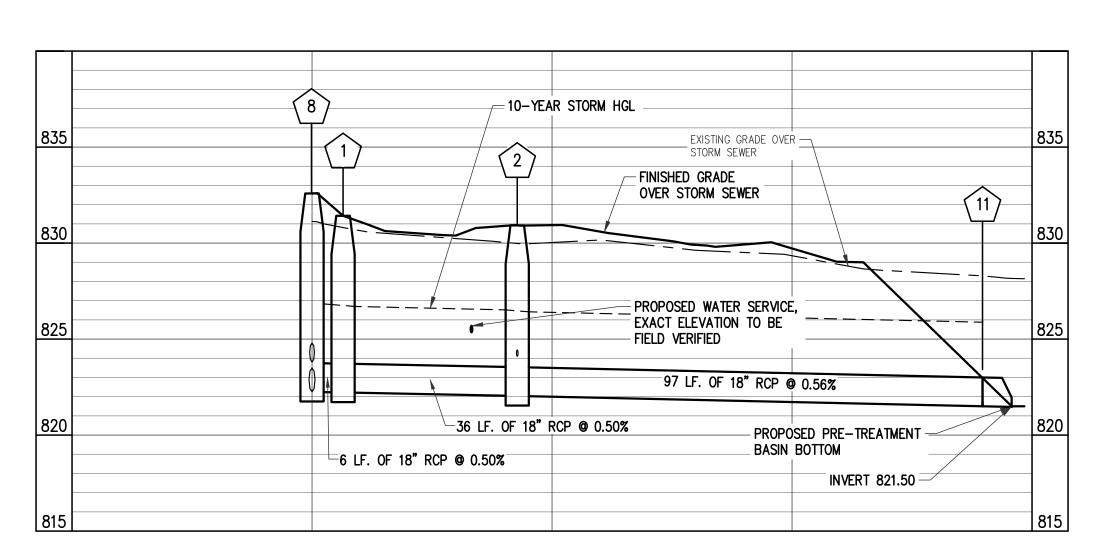
REV:

sнт# **C311** JOB No: 2300634

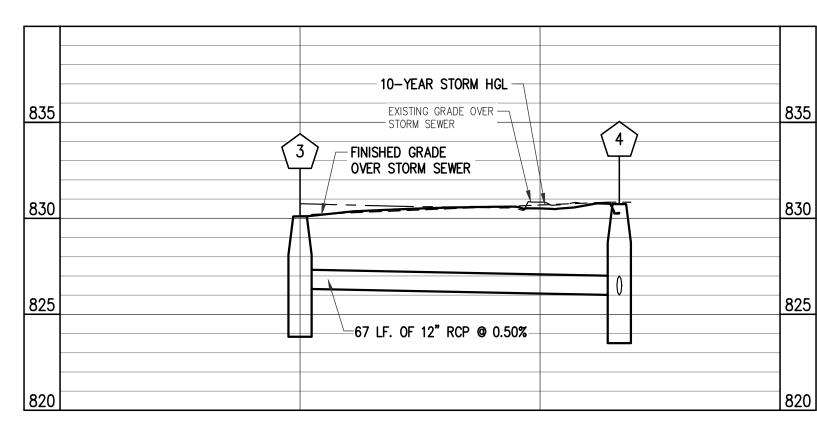
ARBOR PARK





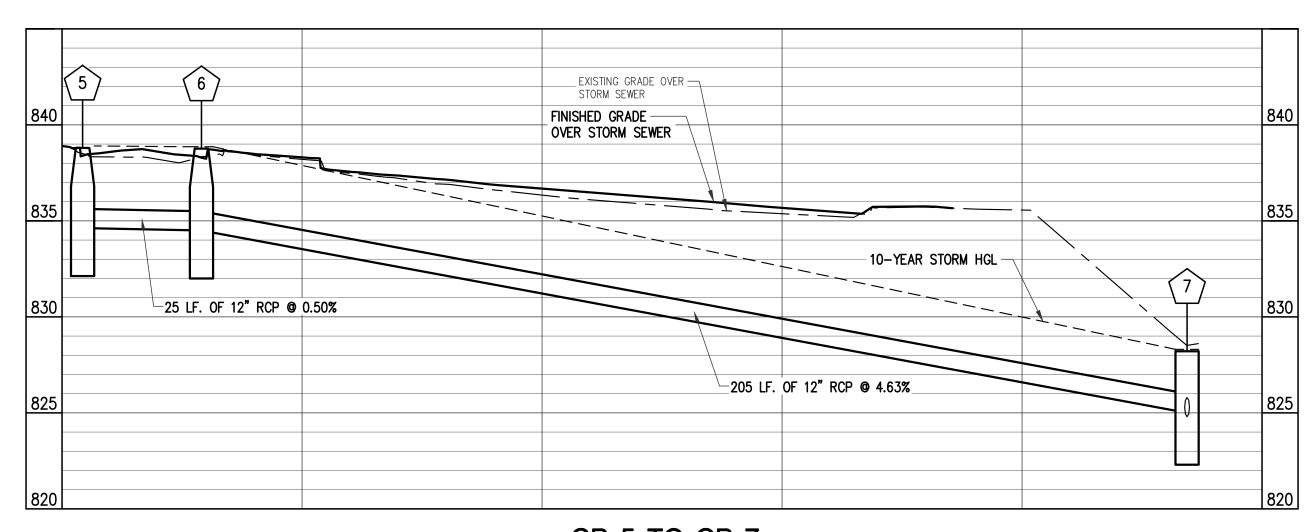


MH EX 5013 TO PROPOSED POND



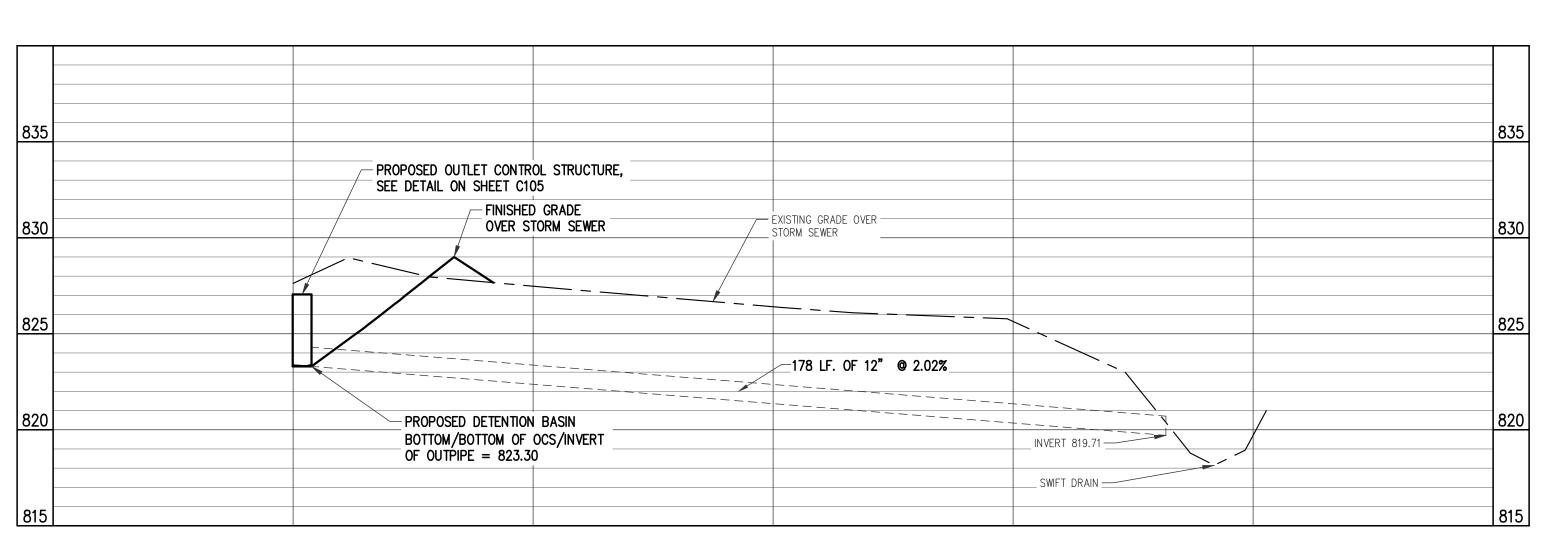
<u>CB 3 TO CB 4</u>

NOTE: THE 10-YEAR STORM HGL OVERTOPS STRUCTURES 3 AND 4.

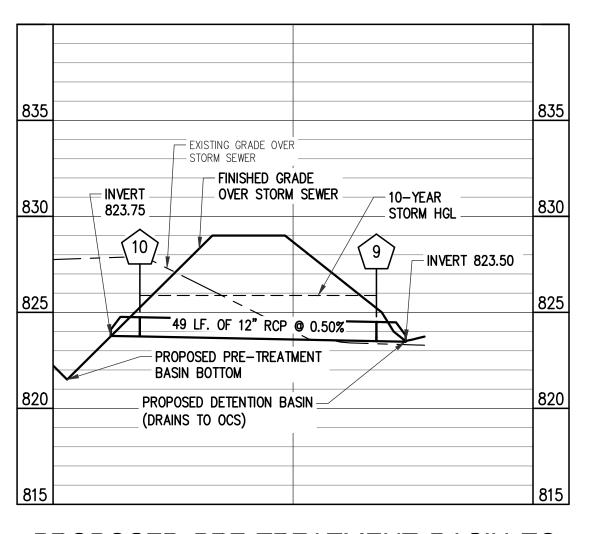


<u>CB 5 TO CB 7</u>

NOTE: THE 10-YEAR STORM HGL OVERTOPS STRUCTURES 5, 6 AND 7.



PROPOSED DETENTION BASIN TO SWIFT DRAIN



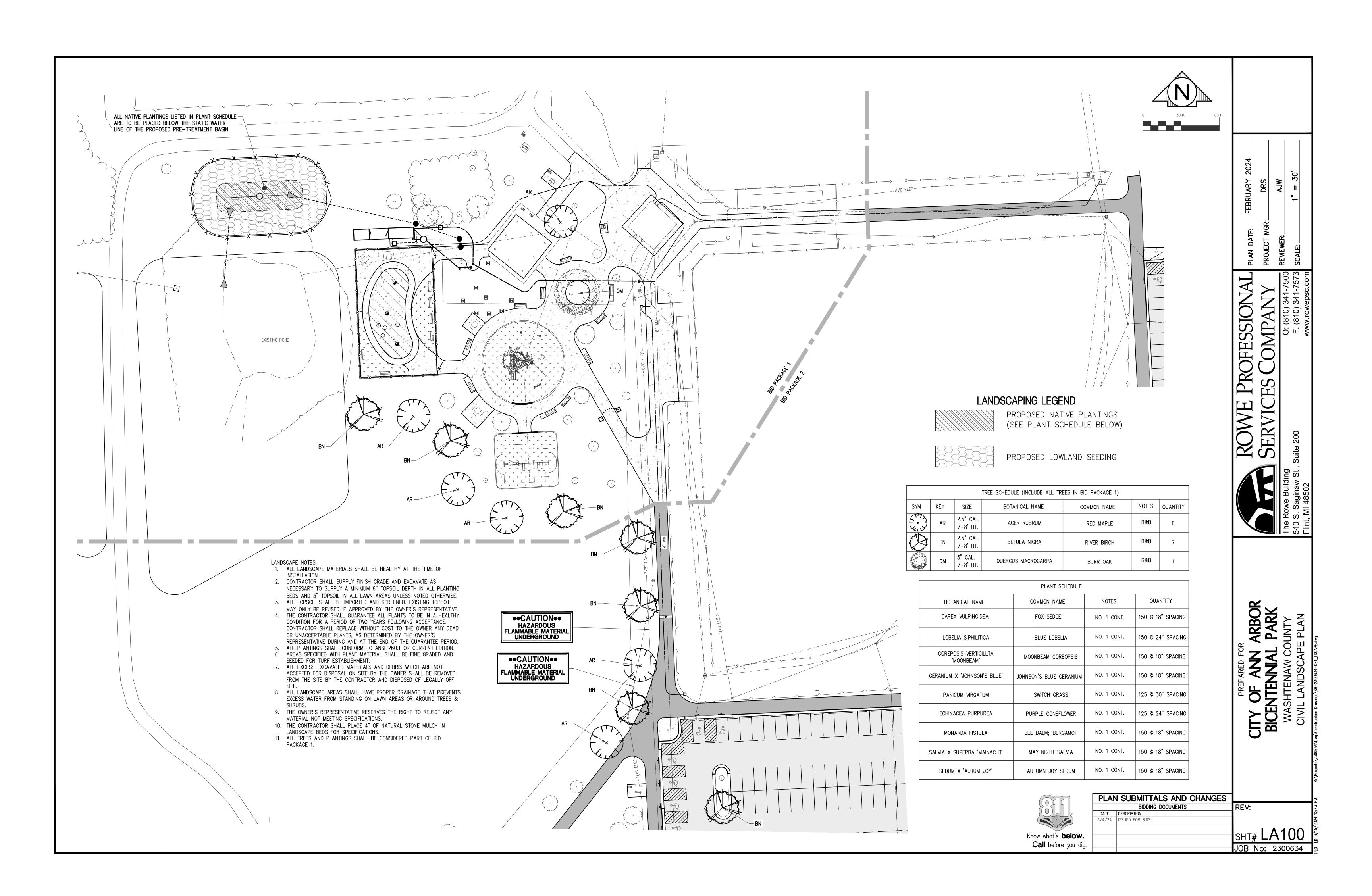
PROPOSED PRE-TREATMENT BASIN TO PROPOSED DETENTION BASIN



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PLAN	N SUBMITTALS AND CHANGES	
	BIDDING DOCUMENTS	REV:
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		sнт# С402
		JOB No: 2300634

ROWE PR Services



Bicentennial Park Restroom and Pavilion Renovations

2901 E. Ellsworth Road, Ann Arbor, Michigan 48108

BUILDING CODE INFORMATION CITY OF ANN ARBOR - DEPARTMENT OF PARKS AND RECREATION SOUTHEAST PARK (RENAMED AS BICENTENNIAL PARK) RESTROOM AND PAVILION RENOVATIONS 2901 EAST ELLSWORTH ROAD, ANN ARBOR, MICHIGAN 48108 UTILITY & MISCELLANEOUS (PARK FACILITIES) **BUILDING CODE:** 2015 MICHIGAN REHABILITATION CODE: ALTERATIONS LEVEL 2 (CHAPTER 8) RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE REMOVAL AND REPLACEMENT OF EXISTING MATERIALS, ELEMENTS, EQUIPMENT AND FIXTURES BUILDING: 2015 MICHIGAN BUILDING CODE ACCESSIBILITY: ICC/ANSI A117.1 1998 AND MICHIGAN **BUILDING PROJECT SUMMARY:** RENOVATIONS AT THE EXISTING COMFORT BUILDING RESTROOMS, INCLUDED BUT NOT LIMITED TO NEW FINISHES. PLUMBING FIXTURES. TOILET PARTITIONS AND TOILET ROOM ACCESSORIES. ALL ASSOCIATES MECHANICAL, ELECTRICAL AND PLUMBING WORK REQUIRED IS ALSO INCLUDED. **CHAPTER 8 - ALTERATION LEVEL 2:** (2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS) RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSULATION OF ANY ADDITIONAL EQUIPMENT **CHAPTER 7 - ALTERATION LEVEL 1:** (2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS) 2015 MRC 701.1 REMOVAL AND REPLACEMENT OF EXISTING MATERIALS, ELEMENTS, EQUIPMENT AND FIXTURES **USING NEW MATERIALS CHAPTER 3 USE and OCCUPANCY CLASSIFICATION:** (2015 MICHIGAN BUILDING CODE SECTION 312.1:UTILITY AND MISCELLANEOUS GROUP "U" EQUIPMENT AND STORAGE AREA **CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREA:** (2015 MICHIGAN BUILDING CODE BUILDING HEIGHT ALLOWABLE PER 2015 MBC TABLE 504.4 2 STORIES ALLOWED ACTUAL: 1 STORY BUILDING AREA ALLOWABLE PER 2015 MBC TABLE 506.2 ALLOWED 5,500 SF ACTUAL: 651 SF RESTROOMS ACTUAL: 1,296 SF PAVILION **CHAPTER 6 TYPES of CONSTRUCTION:** (2015 MICHIGAN BUILDING CODE) 602.5: TYPE 5-B TYPE OF CONSTRUCTION IN WHICH BUILDING ELEMENTS LISTED IN TABLE 601 ARE OF ANY MATERIAL. AS PERMITTED BY THE CODE. PER TABLE MBC 601 TYPE 5-B - ALL MATERIALS 0 HR.....NA **CHAPTER 8 INTERIOR FINISHES:** (2015 MICHIGAN BUILDING CODE MBC SECTION 803.1.1 INTERIOR WALL AND CEILING FINISH MATERIALS CLASS A = FLAME SPREAD INDEX 0-25; SMOKE DEVELOPED INDEX 0-450 CLASS B = FLAME SPREAD INDEX 26-75; SMOKE DEVELOPED INDEX 0-450 CLASS C = FLAME SPREAD INDEX 76-200; SMOKE DEVELOPED INDEX 0-450 CHAPTER 11 ACCESSIBILITY (2015 MICHIGAN BUILDING CODE) MBC 1101.2 DESIGN BUILDING AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE MICHIGAN BARRIER FREE DESIGN LAW, 1966 PA 1, MCL125.1351 TO 125.1356 AS AMENDED AND THE 2009 ICC/ANSI A117.1 STANDARD AS REFERENCED FROM CHAPTER 11 OF THE 2015 MICHIGAN BUILDING

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SPECIFICATIONS

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RESTROOM BUILDING - FLOOR PLAN, REFLECTED CEILING PLAN PAVILION - FLOOR PLAN, REFLECTED CEILING PLAN, and SECTIONS

SECTIONS and DETAILS SCHEDULES and MISC. DETAILS

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ELECTRICAL ONE-LINE DIAGRAM and SCHEDULES

ELECTRICAL SPECIFICATIONS

City of Ann Arbor Department of Parks & Recreation

301 E. Huron Ann Arbor, MI 48104 (Phone) 734-794-6000

Architect:

JFR Architects, PC

33668 Bartola Drive Sterling Heights, MI 48312 (Phone) 586-436-0187

Mechanical and Electrical Engineer:

Lawrin Engineering, LLC

41000 Woodward Avenue Suite 350 East - #4265 Bloomfield Hills, MI 48304 (Phone) 586-601-4219

PUBLIC SWIMMING POOL RULES

SECTION 609.2.1 REQUIRES A SURFACE AREA OF 7,500 SQ FT OR LESS TO HAVE THE FOLLOWING RESTROOM FACILITIES 2 (WC) WATER CLOSETS 1 (LAV) LAVATORIES 1 SHOWER

> 1 (WC) WATER CLOSET 1 (LAV) LAVATORIES 1 SHOWER

2015 INTERNATIONAL SWIMMING POOLS AND SPA CODE (CHAPTER 6

EGLE - PUBLIC SWIMMING POOL RULES):

1,804 SQFT / 100 SQFT = 18 x (10 BATHERS) = 180 BATHERS 977 SQFT / 100 SQFT = 9.7 x (1 BATHERS) = 10 BATHERS

SECTION R 325.2175 (TABLE 2 MINIMUM BATHHOUSE FIXTURES):

= 190 BATHER CAPACITY of SPLASH PAD AND FENCED AREA

CALCUALTED BATHER CAPACITY = 190 BATHERS 4 (WC) WATER CLOSETS required

2 (LAV) LAVATORIES required 3 SHOWER required = 1 PROVIDED outdoor shared 3 (WC) WATER CLOSETS required 1 (UR) URINAL required = 1 PROVIDED

2 (LAV) LAVATORIES required

(WC) WATER CLOSET (LAV) LAVATORIES

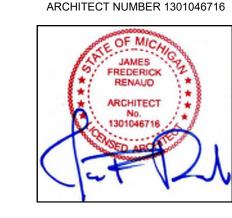
= 2 PROVIDED = 2 PROVIDED

= 1 PROVIDED outdoor shared

100 PERSON MAXIMUM BATHER LIMIT TO BE POSTED AT ALL ENTRANCE GATES OF THE SPLASH PAD

LOCATION MAP Scarlett Middle School: E Ellsworth Rd A2 OFFIC

ARCHITECT JAMES F. RENAUD, AIA ARCHITECT NUMBER 1301046716



www.jfrarchitects.com

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ENGINEER:

SCHEMATIC DESIGN DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S **BIDS & PERMITS**

CONSTRUCTION

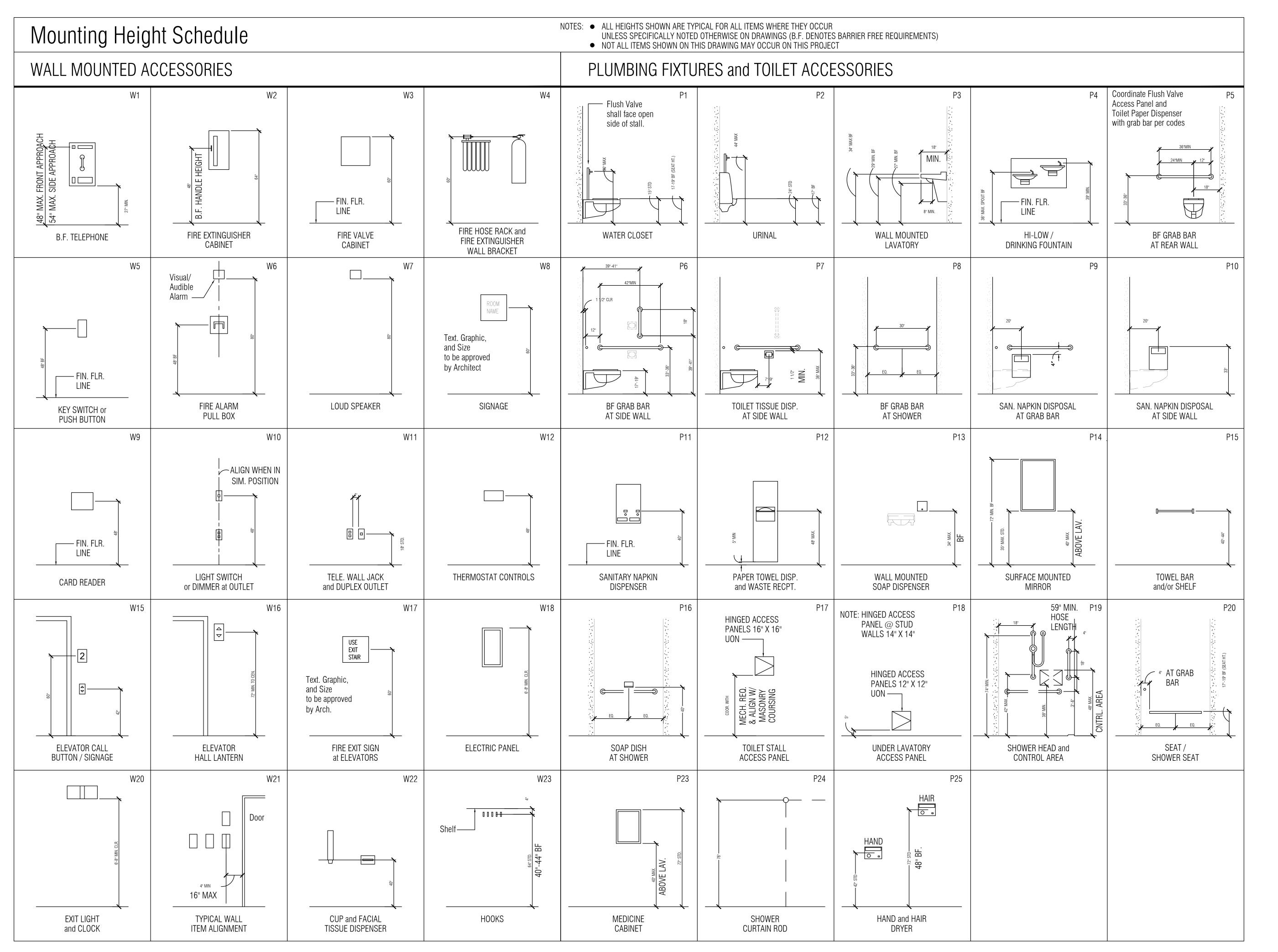
DRAWN BY: CHECKED BY:

SCHEMATIC DESIGN **DESIGN DEVELOPMENT** OWNER REVIEW FINAL REVIEW 12/08/23 **OWNER REVIEW** 01/19/24 EGAL REVIEW PERMITS & BIDS

19 SEPT. 2023

Cover Sheet

and Bldg. Info.



JFR ARCHITECTS

> 33668 BARTOLA DRIVE STERLING HEIGHTS MI 48312 586.436.0187

jfrarchitects@gmail.com www.jfrarchitects.com

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ENGINEER:

PROJECT NAME:

ENTENNIAL PARK TROOMS and PAVILIO

SCHEMATIC DESIGN

DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S

BIDS & PERMITS

CONSTRUCTION

DRAWN BY:

CHECKED BY:
REVISIONS:

 SCHEMATIC DESIGN
 11/07/23

 DESIGN DEVELOPMENT
 11/16/23

 OWNER REVIEW
 11/20/23

 FINAL REVIEW
 12/08/23

 OWNER REVIEW
 01/19/24

 EGAL REVIEW
 02/12/24

 PERMITS & BIDS
 03/14/24

19 SEPT. 2023

PROJECT NO.: 23-037

RAWING NAME:

General Project Information

SHEET NO

G-2

1. Scope:

- A. Provide interior renovations to existing restroom and pavilion building for ADA and maintenance improvements. Contractor to notify owner of temporary conflicts with the operation of the facility 1 week prior to the event. Furnish all materials, labor, transportation, fees, permits, etc. as required to complete the Work as shown on the Drawings and as specified herein.
- B. The intent of the Drawings and Specifications is to describe the complete Project, including materials, labor, equipment and incidentals necessary for the execution and completion of the Work The Scope of the Work shall include all items directly called for by the Drawings and Specifications and all work reasonably to be foreseen and/or inferred in order to completely perform the Work and produce the complete Project as intended.
- C. Contractor and sub-contractors shall verify site conditions. Any inconsistencies between drawings and conditions shall be resolved with the architect prior to commencement of the work.
- D. Contractor shall notify the architect of any conditions discovered where modification of the intent of the design would produce beneficial results.
- E. All dimensions are to the face of finish framing of walls or finish face of concrete unless noted otherwise (u.n.o.).

4. Temporary Facilities

- A. Fire extinguishers as required by the local fire jurisdiction shall be furnished by the Contractor.
- Heating, ventilation, water, electricity and toilet services shall be furnished by the contractor as required.

5. Permits

- A. All required permits and inspections, unless otherwise noted, shall be obtained and paid for by the Contractor without an increase in
- the Contract Sum and without an extension of the Contract Time. B. Plan Check fee and Building Permit fee will be reimbursed at cost by Owner. Reimbursement requests shall be included with final Payment Request and shall be accompanied with a copy of the pertinent receipts.
- 6. General Conditions: American Institute of Architects Document A-201, "General Conditions of the Contract for Construction" (latest edition) is hereby made a part of the Contract Documents by reference and shall have the same effect as if included herein.
- A. The structure is designed to be self-supporting and stable after it is fully completed according to the plans and specifications. It is the contractor's sole responsibility to determine construction/erection procedure and sequence, and to ensure the safety of the structure and its component parts during construction. Temporary bracing, guying and tie downs of the structure during erection shall be the responsibility of the erector and the contractor. The architect / engineer assume no liability for the absence, presence or adequacy of any temporary bracing. Construction shall be braced and protected as required.
- B. The architect / engineer assume no liability for the structure during construction. As such, the means and methods of construction are the sole responsibility of the contractors.
- C. Locate door frames a minimum of 4" off corner to back of frame unless otherwise indicated.

7. Tests and Inspections

- A. All tests and inspections stipulated in the Specifications and/or Drawings shall be performed by the Owner's Testing Laboratory at the Owner's expense.
- The Contractor shall cooperate with the Testing Laboratory and notify the Testing Laboratory sufficiently in advance so that the specified samples, tests, etc. can be accomplished.
- 8. Guarantees: Contractor shall guarantee installation of the Work for a period of one year following the date of Substantial Completion.

9. Cleaning

- A. Contractor shall dispose of all debris, rubbish, etc. for the Project site in a lawful manner during the course of construction without an increase in the Contract Sum and without an extension of the Contract time.
- B. Upon completion of the Work, the contractor shall clean Project Area, including, but not limited to; adjacent flooring, glass, casework, storefront windows, doors, door frames, plumbing fixtures, light fixtures, adjacent tenant entry / storefront, etc.

10. Submittals

- A. Submittals include, but are not limited to, samples, shop drawings, product data, installation instruction for all work to be installed or as requested. Contractor shall not purchase items requiring submittal until submittal has been review and accepted by Architect.
- Samples, including, but not limited to colors, materials textures, finishes, etc. shall be submitted when specified herein or upon request from the Architect. Quantity of samples shall be determined
- C. Owner shall select colors, accept samples, etc. prior to the installation of the item.
- END OF SECTION

SECTION 01630: PRODUCT SUBSTITUTIONS

- 1. Substitutions for items specified herein and on the Drawings shall be allowed. The Owner and Architect shall be the sole judge of equivalent substitute items.
- 2. Wherever catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with a designated material, product, thing, or service mentioned in these Specifications, the catalog numbers and specific brands are used to establish the standards of quality, utility, appearance, etc. required.
- 3. When materials are specified by first manufacturer's name and product number followed by a second manufacturer's name and the designation "or equal", the second manufacturer's and the "or equal" manufacturer's
- accordance with the requirements for substitute items. 4. Substitutions which are equal in quality, utility, and appearance to those specified as judged by the Architect.

product shall be considered a substitution and shall be submitted in

- 5. All substitutions must be accepted by the Architect in writing.
- 6. Sufficient data, Drawings, samples, literature, modifications required to incorporate the proposed substitution and other detailed information as will demonstrate to the Architect that the proposed substitute is equal in quality, appearance, etc. to the specified shall be submitted to the Architect for review and acceptance or rejection.

- The Contractor is solely responsible for submitting sufficient information for the Architect to evaluate the proposed substitution. The submission of insufficient information shall be just cause for the rejection of the proposed substitution.
- 2. The Architect's acceptance of a substitution shall not relieve the Contractor from complying with the requirements of the Drawings and Specifications, and the Contractor shall be responsible, without an increase in the Contract Sum and without an extension of the Contract Time, for any changes resulting for the Contractor's proposed substitutions which affect other parts of the Contractor's own work or the work of others.
- 3. Failure of the Contractor to submit proposed substitutions for review in the manner described above and a timely manner so as not to cause a delay in the Work shall be sufficient cause for rejection of the proposed substitution by the Architect.
- 4. Only one proposed substitution (when allowed) will be submitted for each item. If a proposed substitution is judged by the Architect to be unacceptable, the specified item shall be provided; further substitution submissions for the same item will not be allowed.

5. Contractor representation of substitutions:

- A. Request for substitution constitutes a representation that Contractor has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.
- Contractor will provide same warranty for substitution as for specified product.
- Contractor will coordinate installation of accepted substitute, making such changes be required for Work to be complete in al respects without an increase in the Contract sum and without an extension of the Contract Time.

END OF SECTION

SECTION 02070: SELECTIVE DEMOLITION

- 1. Scope: Removal of existing items as indicated and as required to accomplish the finished project shown: including, but not limited to, architectural, mechanical, plumbing and electrical items as shown on the Drawings and specified herein.
- 2. Contractor shall conform to all federal, state and local ordinances related to the protection of the public and Contractor's personnel. Provide protection for persons and property throughout the progress of the work.
- 3. The full extent of demolition, cutting and patching is not individually shown or specified. The Contractor shall perform all demolition, cutting and patching as required to incorporate the New Work into the existing Building.
- 4. The Contractor is responsible for identifying the types of materials to be demolished, cut and patched.
- 5. Existing items (to remain) damaged by the Contractor in the execution of the Contract Documents shall be restored to its former conditions or replaced by the Contractor as directed by the Architect without an increase in the Contract Sum and without an extension of the Contract Time.
- A. Damaged existing items (to remain) shall include, but not limited to, visible and concealed items, existing items not shown on the Contract Documents and existing items not shown on Record Documents.
- 6. Where existing finishes, such as but not limited to, paint, flooring, bases, ceilings, etc. are removed and replaced with new finishes, the Contractor shall perform all preparatory work required for the installation of the new
- 7. Where a specified construction task, such as the replacement of an electrical panel, adversely impact the occupants of the Building, the Owner reserves the right to require the task to be accomplished during hours as determined by the Owner.
- 8. Demolition work shall not be commenced until all temporary work such as barricades and any required warning signs and apparatus are furnished and installed as required by law, regulation, and/or ordinance, or elsewhere in this Specification.
- 9. Demolition work shall proceed in such a manner as to minimize the spread of dust and flying particles and to provide safe working conditions for personnel.

10. Fire and explosives shall not be permitted.

11. All materials and equipment not scheduled to be salvaged, including debris and rejected salvaged materials shall become the property of the Contractor and shall be disposed of off the site in a legal manner. Location of dump and length of haul shall be the Contractor's responsibility.

END OF SECTION

DIVISION 3 - CAST IN PLACE CONCRETE

- 1.1 MANUFACTURERS
- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to Available Products: Subject to compliance with requirements, products that may be incorporated into
- the Work include, but are not limited to, products specified. 2. Products: Subject to compliance with requirements, provide one of the products specified.
- Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- 4. Manufacturers: Subject to compliance with requirements, provide products by one of the
- manufacturers specified. 1.2 FORM-FACING MATERIALS

concrete on removal.

- Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and
- smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Plywood, metal, or other approved panel materials
- 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better. b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed. c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber

tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic

concrete loads without detrimental deformation Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support

weight of plastic concrete and other superimposed loads.

- Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain. or adversely affect concrete surfaces and will not impair subsequent treatments of concrete
- 1. Formulate form-release agent with rust inhibitor for steel form-facing materials. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form

ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of

- Fly Ash: 25 percent.
- Combined Fly Ash and Pozzolan: 25 percent.
- 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland

- Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete
- 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete
- 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or
- 1.3 STEEL REINFORCEMENT
- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.
- 1.4 REINFORCEMENT ACCESSORIES

B. Plain-Steel Wire: ASTM A 82, as drawn

D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to

- length with ends square and free of burrs. B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows
- 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
- 1.5 CONCRETE MATERIALS A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project
- 1. Portland Cement: ASTM C 150, Type Igray. Fly Ash: ASTM C 618, Class [C].
- a. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, Class [3S] coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates

Maximum Coarse-Aggregate Size: [1 inch (25 mm)] nominal.

- 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.
- 1.6 ADMIXTURES Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
- Water-Reducing Admixture: ASTM C 494/C 494M, Type A. Retarding Admixture: ASTM C 494/C 494M, Type B.
- Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G. 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- 7. Color: As selected by Architect from manufacturer's full range.

- A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes. Available Manufacturers
 - a. Greenstreak. b. Progress Unlimited, Inc
- c. Williams Products, Inc.
- Profile: Flat, dumbbell with center bulb. 3. Dimensions: [4 inches by 3/16 inch thick (100 mm by 4.75 mm thick)]; nontapered.
- B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete. 3/4 by 1 inch (19 by 25 mm).
 - a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
 - b. Concrete Sealants Inc.; Conseal CS-231.
 - c. Greenstreak: Swellstop. d. Henry Company, Sealants Division; Hydro-Flex.
 - e. JP Specialties, Inc.; Earthshield Type 20. f. Progress Unlimited, Inc.; Superstop g. TCMiraDRI: Miraston
- h. VAPOR RETARDERS C. Plastic Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
- b. Stego Industries, LLC; Stego Wrap, 6 mils.
- D. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed grayel: ASTM D 448 Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand: ASTM D 448. Size 10, with 100 percent passing a 3/8-inch (9.5-mm) sieve, 10 to 30 percent passing a No. 100 (0.15-mm) sieve, and at least 5 percent passing No. 200 (0.075-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates

1.8 CURING MATERIALS

Available Products:

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing pproximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

1.9 RELATED MATERIALS

Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily

fill or cover face opening of reglet to prevent intrusion of concrete or debris. D. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch (0.85 mm)

thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion

1.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match
- 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and
- 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacture 4. Compressive Strength: Not less than [4100 psi (29 MPa)] at 28 days when tested according to
- ASTM C 109/C 109M. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in
- thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations. 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
- Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacture 4. Compressive Strength: Not less than [5000 psi (34.5 MPa)] at 28 days when tested according to ASTM C 109/C 109M
- 1.11 CONCRETE MIXTURES, GENERAL
- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
- Ground Granulated Blast-Furnace Slag: 50 percent.
- cement minimum, with fly ash or pozzolan not exceeding 25 percent.

- CONCRETE MIXTURES FOR BUILDING ELEMENTS
- Footings: Proportion normal-weight concrete mixture as follows:
- Minimum Compressive Strength: [4000 psi (27.6 MPa)] at 28 days
- Maximum Water-Cementitious Materials Ratio: [0.50].
- 1. Slump Limit: [4 inches (100 mm)], plus or minus 1 inch (25 mm). Air Content: [6] percent, plus or minus 1.5 percent at point of delivery for [1-inch (25-mm)] nominal maximum
- A. Foundation Walls: Proportion normal-weight concrete mixture as follows: 1. Minimum Compressive Strength: [4000 psi (27.6 MPa)] at 28 days.
- Maximum Water-Cementitious Materials Ratio: [0.50].
- 2. Slump Limit: [4 inches (100 mm)], plus or minus 1 inch (25 mm). Air Content: [6] percent, plus or minus 1.5 percent at point of delivery for [1-inch (25-mm)] nominal maximum
- B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows: Minimum Compressive Strength: [4000 psi (27.6 MPa)] at 28 days. Minimum Cementitious Materials Content: [520 lb/cu. yd. (309 kg/cu. m)].
- Air Content: [6] percent, plus or minus 1.5 percent at point of delivery for [1-inch (25-mm)] nominal
- 4. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
- D. Suspended Slabs: Proportion normal-weight concrete mixture as follows Minimum Compressive Strength: [4000 psi (27.6 MPa)] at 28 days

Slump Limit: [4 inches (100 mm)], plus or minus 1 inch (25 mm).

- Minimum Cementitious Materials Content: [520 lb/cu. yd. (309 kg/cu. m)]. Slump Limit: [4 inches (100 mm)], plus or minus 1 inch (25 mm).
- Air Content: [6] percent, plus or minus 1.5 percent at point of delivery for [1-inch (25-mm)] nominal maximum aggregate size.
- 5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent
- 1 13 FARRICATING REINFORCEMENT A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- 1.14 CONCRETE MIXING
- When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and

- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixel For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released
- For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m) Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record

DIVISION 4 - MASONRY

SECTION 04200: UNIT MASONRY

approximate location of final deposit in structure.

PART 1 - GENERAL 1.1 SUMMARY

furnish batch ticket information

- A. Furnish and install all labor, materials and equipment required for completion of concrete masonry units. Refer to structural drawings and specifications for masonry, reinforcement, mortar and grout materials standards and requirements.
- 1.2 SUBMITTALS A. Product data: For each type of product indicated.
- B. Material certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. A. Mix designs: For each type of mortar and grout. Include description of type and

B. Statement of compressive strength of masonry: For each combination of masonry

of masonry determined according to tables 1 and 2 in section 1.4 of the MSJC code.

- unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS
- A. Grand Blanc Cement Products or Architect approved equal.
- 2.2 CONCRETE MASONRY UNITS (CMUs) A. Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement
 - joints, headers, bonding, and other special conditions. 1. Supply standard open-end units and open-end bond beam units to facilitate placement of vertical reinforcement. units shall comply with the material
- specification of adjacent construction. B. Concrete masonry units: ASTM C 90
- 1. Unit compressive strength: Provide units with minimum average net-area
- compressive strength of 1500 PSI. 2. Weight classification: Normal weight.
- 3. Pattern and texture for decorative units: Standard pattern, ground finish. 4. Types:
- a. CMU-1: 5-5/8 inches wide by 7-5/8 inches high by 15-5/8" long (actual size), standard unit with gray finish. Paint where exposed.
- C. Portland cement: ASTM C 150, Type I or II. D. Hydrated lime: ASTM C 207 Type S.
- E. Mortar cement: ASTM C 1329.
- F. Masonry cement: ASTM C 91 G. Aggregate for mortar: ASTM C 144.

H. Aggregate for grout: ASTM C 404.

- Water: Potable.
- 2.3 REINFORCEMENT
- A. Uncoated steel reinforcing bars: ASTM A 615/A 615M or ASTM A 996/A 996M, B. Masonry joint reinforcement: ASTM A 951; MILL Galvanized, carbon-steel wire for
- interior walls and hot-dip galvanized, carbon-steel wire for exterior walls. A. Interior walls: Mill- galvanized, carbon steel.

1. Do not use calcium chloride in mortar or grout.

- 5. Wire size for side rods: W1.7 or 0.148-inch diameter. 6. Wire size for cross rods: W1.7 or 0.148-inch diameter.
- 7. Spacing of cross rods, tabs, and cross ties: Not more than 16 inches o.c.
- 2.4 MORTAR AND GROUT MIXES A. General: Do not use admixtures, unless otherwise indicated.

8. Single-wythe masonry: Either ladder or truss type with single pair of side rods.

2. Use portland cement-lime, masonry cement or mortar cement mortar unless otherwise indicated.

- B. Mortar for unit masonry: Comply with ASTM C 270, proportion specification.
- 1. For reinforced or unreinforced masonry, use Type M or S.

C. Grout for unit masonry: Comply with ASTM C 476.

of grout spaces and pour height.

according to ASTM C 143/C 143M.

3.1 INSTALLATION, GENERAL

ACI 530.1/ASCE 6/TMS 602.

SECTION 06100: ROUGH CARPENTRY

DIVISION 6 - WOOD AND PLASTICS

2.1 WOOD PRODUCTS, GENERAL

2.2 DIMENSION LUMBER

agency indicated

the following species:

2.3 MISCELLANEOUS LUMBER

blocking, nailers and furring.

1. Mixed southern pine; SPIB.

1. Mixed southern pine; SPIB

2. For mortar parge coats, use Type S. 3. For interior non-load-bearing partitions; and for other applications where another

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse)

2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured

A. Use full-size units without cutting if possible. If cutting is required, cut units with

hardware, etc. as shown on drawings and specified herein.

1. Factory mark each piece of lumber with grade stamp of grading agency.

for 2-inch nominal thickness or less, unless otherwise indicated.

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by

2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20

4. Provide dry lumber with 19 percent maximum moisture content at time of dressing

for moisture content specified. Where actual sizes are indicated, they are

A. General: Provide dimension lumber of grades indicated according to the American

B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of

3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

A. General: Provide lumber for support or attachment of other construction, including

3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.

C. For concealed boards, provide lumber with 19 percent maximum moisture content

2. Hem-fir or Hem-fir (north), Construction or 2 Common grade; NLGA, WCLIB, or

A. Furnish all items of rough hardware, connections to metal studs, bolts, and other

miscellaneous items as required to complete the work. Bolts, nuts and washers shall

be hot dipped galvanized, conforming to ASTM A-153. Washers shall be malleable

iron. Hardware for attachment of wood blocking to metal studs shall also be

3. Spruce-pine-fir (south) or Spruce-pine-fir, Construction or 2 Common grade;

knots capable of producing bent-over nails and damage to paneling.

lumber with 19 percent maximum moisture content and any of the following species:

B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade

Lumber Standards Committee National Grading Rule provisions of the grading

where possible, cut edges concealed. Comply with tolerances in

1. SCOPE: Furnish and install all rough carpentry, including rough

the American Lumber Standards Committee Board of Review.

3. Provide dressed lumber, S4S, unless otherwise indicated.

2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.

2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.

galvanized. Nailing shall conform to applicable codes

DIVISION 7 - THERMAL AND MOISTURE AND SOUND PROTECTION

1. Scope: Furnish and install all sound insulation as shown on the

A. Unfaced glass fiber noise barrier batts as manufactured

by Owens-Corning fiberglass corporation, Manville or equal.

C. Install insulation above suspended gypsum board and acoustical

A. Provide material, labor, and all necessary accessories required for

A. Submit shop drawings covering each type of door and frame, frame

conditions and complete anchorage details, supplemented by

B. Submit samples of standard colors and finishes of field assembled

MANUFACTURED AS DETAILED BY ONE OF THE FOLLOWING

A. Sheet Steel for frames: ASTM C-366 commercial grade, cold rolled

1. Exterior: zinc coated not less than 0.01 oz per square foot.

B. Sheet steel for doors: cold rolled stretcher level sheet steel.

the installation of the hollow metal doors and frames.

ceilings by laying on top of ceiling panels, butting batts tightly

together extended 2' minimum beyond each side of partition.

Install between studs, full depth of studs and full height of wall or

and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.

NELMA, NLGA, WCLIB, or WWPA.

E. All lumber to be fire retardant treated.

SECTION 07210 - BUILDING INSULATION

drawings and specified herein.

DIVISION 8 - DOORS AND WINDOWS

as indicated on drawings.

SECTION 08110 - HOLLOW METAL DOORS AND FRAMES

2. RELATED WORK SPECIFIED ELSEWHERE

C. Carpentry: Sections: 06100 and 06200.

E. Materials installed but furnished by others:

suitable schedule covering doors and frames.

A. HOLLOW METAL DOORS AND FRAMES SHALL BE AS

A. Finish Hardware: Section 08700.

B. Glass: Section 08800.

D. Painting: Section 09900.

1. Finish Hardware.

Weatherstripping

frames and doors

MANUFACTURES:

3. APPROVED EQUAL

2. Interior: uncoated

PART 2 PRODUCTS

5. MANUFACTURERS

1. CECO

MATERIALS

2. PIONEER

4. DELIVERY, STORAGE AND HANDLING

2.4 ROUGH HARDWARE

END OF SECTION

Sound insulation:

END OF SECTION.

PART 1 GENERAL

SUBMITTALS

SCOPE OF WORK

C. All dimensional lumber to be fire retardant treated.

minimum dressed sizes for dry lumber.

motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before

laying unless wetting of units is specified. install cut units with cut surfaces and,

that will comply with table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions

- type is not indicated, use Type N.
 - Brake-formed sheet steels: 1. Provide profiles and shapes free of warp, buckles, fractures, or

Minimum gauges: 14 gauge interior.

DIVISION 8 - DOORS AND WINDOWS (cont.)

- other defects.
- 2. Form stops integral with frames unless otherwise shown. 3. Stops shall be located on non-secure side.
- Miter corners, weld connections and grind exposed welds smooth and flush.
- Anchors:
- 1. At masonry walls, provide 14 ga. corrugated anchors at each jamb for each 2'-8" of door height or fraction there of. 2. Vary anchor types to provide positive fastening to adjacent
- 3. Secure 12 ga. metal clips angel at bottom of each jamb member for anchoring to the floor, with a minimum of 2
- F. Provide three rubber bumpers at the latch side of the door frame. 4. DOORS
- A. Face sheets: 14 gauge steel. B. Internal stiffeners:
- 1. Minimum 20 ga. steel.
- 2. Space not over 6" on center. 3. Spot weld to face panel at maximum 5" intervals.
- 4. Join and weld vertical edges of face panels at min.6" centers, grind smooth and fill with mineral filler to conceal seams. C. Treat interior surfaces with sound deadening material to eliminate
- metallic ring. Insulate Exterior doors with rigid polystyrene insulation. Furnish top closure channels on all exterior hollow metal doors.

Maintain flatness tolerance of 1/16" in all directions. END OF SECTION

PART 1 - GENERAL

SECTION 08710 - DOOR HARDWARE

- 1.1 RELATED DOCUMENTS A. Drawings and general provisions of the contract, including general and supplementary conditions and division 01 specification sections, apply to this
- 1.2 SUMMARY

section.

- A. Section includes:
- 1. Mechanical door hardware for the following:
- b. Sliding doors. c. Folding doors.

2. Cylinders for door hardware by Owner.

3. Electrified door hardware.

and profiles, and finishes.

a. Swinging doors.

- 1.3 ACTION SUBMITTALS A. Product data: For each type of product indicated. include construction and installation details, material descriptions, dimensions of individual components
- B. Schedules shall be kept current with all changes to the project. if changes D. For furring strips for installing plywood or hardboard paneling, select boards with no occur, project hardware schedules shall be maintained to reflect the changes as they are approved. Omitted items shall be deleted from openings, added and replaced items shall be included. Installation submittals shall be kept current as changes occur. upon request, a complete updated hardware schedule shall be provided to the contractor. Supplemental submittals that

include only the changed openings will not be acceptable.

- C. Shop drawings: Details of electrified door hardware, indicating the following: 1. Wiring diagrams: for power, signal, and control wiring and including the
- a. Details of interface of electrified door hardware and building safety and
- b. Schematic diagram of systems that interface with electrified door
- hardware. c. Point-to-point wiring.

d. Risers.

E. Other action submittals:

- e. Elevations doors controlled by electrified door hardware. 2. Operation narrative: Describe the operation of doors controlled by electrified door hardware.
- detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware. a. Submittal sequence: Submit door hardware schedule concurrent with

1. Door hardware schedule: Prepared by or under the supervision of installer,

submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in project construction schedule. b. Format: Comply with scheduling sequence and vertical format in dhi's

"sequence and format for the hardware schedule." Double space

submissions of product data, samples, and shop drawings. Coordinate

c. Format: Use same scheduling sequence and format as in the contract documents.

entries, and number and date each page.

d. Content: Include the following information:

of each door and frame. 2) Locations of each door hardware set, cross-referenced to drawings on floor plans and to door and frame schedule.

1) Identification number, location, hand, fire rating, size, and material

3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.

4) Description of electrified door hardware sequences of operation and

5) Fastenings and other pertinent information.

6) Explanation of abbreviations, symbols, and codes contained in

interfaces with other building control systems.

7) Mounting locations for door hardware.

coordinated with the contract documents.

8) List of related door devices specified in other sections for each door and frame. 2. Keying schedule: Prepared by or under the supervision of installer,

detailing Owner's final keying instructions for locks. Include schematic

keying diagram and index each key set to unique door designations that are

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PROJECT NAME:

ENGINEER:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S

BIDS & PERMITS

CONSTRUCTION

DRAWN BY: CHECKED BY: REVISIONS: SCHEMATIC DESIGN 11/16/23 DESIGN DEVELOPMENT OWNER REVIEW 11/20/23 FINAL REVIEW 12/08/23

OWNER REVIEW

EGAL REVIEW

PERMITS & BIDS

19 SEPT. 2023

01/19/24

02/12/24

03/14/24

DRAWING NAME:

Specs.

General

2. HOLLOW METAL FRAMES A. Frame shall be combination buck frame of profiles as indicated.

A R C H I T E C T S

STERLING HEIGHTS MI 48312 586.436.0187

33668 BARTOLA DRIVE

jfrarchitects@gmail.com

www.jfrarchitects.com Statement of Intellectual Property

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- 1.4 INFORMATIONAL SUBMITTALS
- A. Qualification data: For installer and architectural hardware consultant.
- B. Product certificates: For electrified door hardware, from the manufacturer 1. Certify that door hardware approved for use on types and sizes of labeled

fire-rated doors complies with listed fire-rated door assemblies.

- C. Product test reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible
- D. Warranty: Special warranty specified in this section.
- 1.5 CLOSEOUT SUBMITTALS
- A. Maintenance data: For each type of door hardware to include in maintenance manuals. include final hardware and keying schedule.
- 1.6 QUALITY ASSURANCE
- A. Installer qualifications: supplier of products and an employer of workers trained and approved by product manufacturers and an architectural hardware consultant who is available during the course of the work to consult with contractor, architect, and owner about door hardware and keying.
- 1. Warehousing facilities: In project's vicinity.

who is currently certified by dhi as follows:

- 2. Scheduling responsibility: Preparation of door hardware and keying schedules.
- 3. Engineering responsibility: Preparation of data for electrified door hardware, including shop drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this project.
- B. Hardware supplier qualifications: The hardware supplier must be a corporate member in good standing of the Door and Hardware Institute (DHI), employing at least one Architectural Hardware Consultant (AHC) who is currently participating in DHI's continuing education program (CEP).
- C. Architectural hardware consultant qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this project and
- 1. For door hardware, an Architectural Hardware Consultant (AHC).
- D. Source limitations: Obtain each type of door hardware from a single
- 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- E. Fire-rated door assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with nfpa 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to nfpa 252 or ul 10c, unless otherwise indicated.
- F. Smoke- and draft-control door assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL1784 And installed in compliance with
- 1. Air leakage rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 pa) of
- G. Electrified door hardware: Listed and labeled as defined in NFPA 70, article 100, by a testing agency acceptable to authorities having jurisdiction.
- H. Means of egress doors: Latches do not require more than 15 lbf (67 n) to release the latch. locks do not require use of a key, tool, or special knowledge
- A. Accessibility requirements: For door hardware on doors in an accessible route.
- 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf
- 2. comply with the following maximum opening-force requirements:
- a. Interior, non-fire-rated hinged doors: 5 lbf (22.2 n) applied perpendicular to door.
- b. Sliding or folding doors: 5 lbf (22.2 n) applied parallel to door at latch.
- c. Fire doors: Minimum opening force allowable by authorities having
- 3. Bevel raised thresholds with a slope of not more than 1:2. provide thresholds not more than 1/2 inch (13 mm) high.
- 4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- J. Keying conference: Conduct conference at project site to comply with requirements in section 013100 "project management and coordination." In addition to Owner, Construction Manager, Contractor, and Architect, conference participants shall also include installer's architectural hardware consultant and owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
- 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
- 2. Preliminary key system schematic diagram.
- 3. Requirements for key control system.
- 4. Requirements for access control.
- 5. Address for delivery of keys.
- K. Preinstallation conference: Conduct conference at project site.
- 1. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 2. Inspect and discuss preparatory work performed by other trades.
- 3. Inspect and discuss electrical roughing-in for electrified door hardware.
- 4. Review sequence of operation for each type of electrified door hardware.
- 5. Review required testing, inspecting, and certifying procedures
- L. Items of hardware not definitely specified herein but necessary for completion of the work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to the adjacent hardware. Where size and shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required.

- 1.7 DELIVERY, STORAGE, AND HANDLING
- F. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to project site.
- G. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- H. Deliver keys to manufacturer of key control system for subsequent delivery to
- I. Deliver keys to owner by registered mail or overnight package service.
- 1.8 COORDINATION
- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. cast anchoring inserts into concrete.
- B. Installation templates: Distribute for doors, frames, and other work specified to be factory prepared. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with owner's security consultant.
- D. Electrical system roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and
- E. Existing openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.
- 1.9 WARRANTY
- F. Special warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
- 1. Failures include, but are not limited to, the following:
- a. Structural failures including excessive deflection, cracking, or breakage.
- b. Faulty operation of doors and door hardware.
- c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
- 2. Warranty period: One year from date of substantial completion, unless otherwise indicated.
- a. Exit devices: Two years from date of substantial completion.
- b. Manual closers: Ten years from date of substantial completion.
- B. Factory direct order number shall be provided for each shipment of locks, closers and exit devices with warranty, prior to final payment.

1.10 MAINTENANCE SERVICE

- A. MAINTENANCE TOOLS AND INSTRUCTIONS: FURNISH A COMPLETE SET OF SPECIALIZED TOOLS AND MAINTENANCE INSTRUCTIONS FOR OWNER'S CONTINUED ADJUSTMENT, MAINTENANCE, AND REMOVAL AND REPLACEMENT OF DOOR HARDWARE.
- B. MAINTENANCE SERVICE: BEGINNING AT SUBSTANTIAL COMPLETION, PROVIDE SIX MONTHS' FULL MAINTENANCE BY SKILLED EMPLOYEES OF DOOR HARDWARE INSTALLER. INCLUDE QUARTERLY PREVENTIVE MAINTENANCE, REPAIR OR REPLACEMENT OF WORN OR DEFECTIVE COMPONENTS, LUBRICATION, CLEANING, AND ADJUSTING AS REQUIRED FOR PROPER DOOR AND DOOR HARDWARE OPERATION. PROVIDE PARTS AND SUPPLIES THAT ARE THE SAME AS THOSE USED IN THE MANUFACTURE AND INSTALLATION OF ORIGINAL PRODUCTS.

PART 2 - PRODUCTS

- 2.1 SCHEDULED DOOR HARDWARE
- A. Provide door hardware for each door as scheduled in Part 3 "Door Hardware Schedule" article to comply with requirements in this section.
- 1. Door hardware sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
- 2. Sequence of operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" article. Products are identified by using door hardware designations, as follows:
- 1. References to bhma designations: Provide products complying with these designations and requirements for description, quality, and function.
- 2.2 MECHANICAL LOCKS AND LATCHES
- A. As indicated in door hardware schedule.
- 2.3 EXIT DEVICES AND AUXILIARY ITEMS: BHMA A156.3.
- A. As required to meet the door manufacturer's requirements.
- 2.4 LOCK CYLINDERS
- A. Lock cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver
- B. All final cylinders to be provided by owner. Locks to be provided with cylinders to be used as needed to secure project until owner's cylinders are installed.
- 2.5 KEYING
- A. All keying to be provided by owner.
- 2.6 FABRICATION
- A. Manufacturer's nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
- 1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and bhma a156.18.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
- 1. Concealed fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

- 1. Concealed fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
- Fire-rated applications:
- a. Wood or machine screws: For the following:
- 1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
- 2) Strike plates to frames.
- 3) Closers to doors and frames.
- b. Steel through bolts: For the following unless door blocking is provided:
- 1) Surface hinges to doors.
- Closers to doors and frames 3) Surface-mounted exit devices
- 3. Spacers or hex bolts: For through bolting of hollow-metal doors.
- 4. Fasteners for wood doors: Comply with requirements in dhi wdhs.2 recommended fasteners for wood doors."
- 5. Gasketing fasteners: Provide non-corrosive fasteners for exterior applications and elsewhere as indicated.
- 2.7 FINISHES
- A. Provide finishes complying with bhma a156.18 as indicated in door hardware
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of finished work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples. noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize

PART 3 - EXECUTION

- 3.1 EXAMINATION
- A. Examine doors and frames, with installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been
- 3.2 PREPARATION
- and frames according to ansi/sdi a250.6. B. Wood doors: Comply with DHI WDHS.5 "recommended hardware

A. Steel doors and frames: For surface applied door hardware, drill and tap doors

- reinforcement locations for mineral core wood flush doors."
- A. Mounting heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing
- 1. Standard steel doors and frames: ANSI/SDI A250.8
- 2. Custom steel doors and frames: HMMA 831. 3. Wood doors: DHI WDHS.3, "recommended locations for architectural
- hardware for wood flush doors." B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
- 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
- 2. Drill and countersink units that are not factory prepared for anchorage
- fasteners. space fasteners and anchors according to industry standards. C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Intermediate offset pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater
- than 90 inches (2286 mm). E. Boxed power supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. verify location with architect.
- 1. Configuration: Provide one power supply for each door opening with electrified door hardware. F. Thresholds: Set thresholds for exterior doors and other doors indicated in full
- G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. do not mount floor stops where they will
- H. Perimeter gasketing: Apply to head and jamb, forming seal between door and
- I. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are J. Door bottoms: Apply to bottom of door, forming seal with threshold when door
- 3.4 FIELD QUALITY CONTROL
- A. Independent architectural hardware consultant: Owner will engage a qualified independent architectural hardware consultant to perform inspections and to prepare inspection reports.
- 1. Independent architectural hardware consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- 1. Spring hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
- 2. Electric strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
- 3. Door closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy adjustment: Approximately six months after date of substantial completion, installer's architectural hardware consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.
- 3.6 CLEANING AND PROTECTION
- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of substantial completion.
- 3.7 DEMONSTRATION
- A. Engage a factory-authorized service representative to train owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

SECTION 09900 - PAINT

- Scope: Furnish all labor, materials, and equipment required to prepare surfaces to receive paint and to paint existing surfaces as required and all new unpainted surfaces as shown on drawings and specified herein. Manufacturers: Basis of Design Sherwin Williams or a comparable
- product by one of the following: Porter Paints by PPG Sherman Williams
- Owner Approved Equal
- Colors: To be selected by Architect. See Finish Schedule.
- Paint systems Paint system coatings listed are Fuller-O'Brien and are specified as a standard of quality, utility and appearance.

3rd Coat 212-XX AA acrylic eggshell enamel

- Interior Paint Systems 1. Paint System 1: Gypsum Board 1st Coat 220-20 latex wall primer 2nd Coat 220-XX latex wall finish
- 2. Paint System 2: Hardwood 1st Coat 220-01 lacquer sanding sealer 2nd Coat ww0-XX latex wall finish

3rd Coat ww0-XX latex wall finish

- 3. Paint System 3: Metals 1st Coat 220-02 latex enamel undercoat. 2nd Coat 212-XX AA acrylic semi-gloss enamel 3rd Coat 212-XX AA acrylic semi-gloss enamel
- 4. Paint System 4: Wood 1st Coat 220-02 latex enamel undercoat. 2nd Coat 212-XX AA acrylic semi-gloss enamel
- 3rd Coat 212-XX AA acrylic semi-gloss enamel Miscellaneous Paint System 1. All existing surfaces shall receive new paint finish where
- 2. All new surfaces shall receive paint finish except factory finished items as excluded herein.

3. Apply three coat paint system compatible with surface

- required to be painted. Preparation.
- Surfaces Previously Painted Existing surfaces previously painted shall receive a new paint finish where required to match new finishes & colors.
- 2. Existing surfaces shall be thoroughly cleaned of all grease, dirt, dust or other foreign matter.
- 3. Blistering, cracking, flaking, and peeling or other deteriorated coatings shall be removed. 4. Smooth surfaces shall be lightly roughened to receive
- new paint finish. Roughening shall not telegraph through 5. Damaged areas such as, but not limited to, nail holes,
- cracks, chips, and spills shall be repaired with suitable materials to match adjacent undamaged areas. 6. Edges of chipped paint shall be feather edged and sanded
- 7. Rusty metal surfaces shall be cleaned to clean bare metal. 8. Solvent, mechanical or chemical cleaning methods shall be used to provide surfaces suitable for repainting. 9. Contractor shall be solely respoinsible for determining the amount of preparation previously painted surfaces require in order to receive new paint finishes. Contract Sum will
- not be increased and the Contract Time will not be extended for preparation work on previously painted surfaces.
- Surface preparation. General a. Items not to be painted which are in contact with or adjacent to painted surfaces shall be removed or protected prior to surface preparation and painting operations. b. Exposed ferrous metals including nails on or in contact with surfaces to be painted with water

thinned paints shall be spot primed with zinc dust

zinc oxide, zinc yellow iron oxide, or zinc chromate

- c. Surfaces to be painted shall be clean before applying paint or surface treatments. Oil and grease shall be removed with clean cloths and cleaning solvents prior to mechanical cleaning. d. Cleaning solvents shall be of low toxicity with a flash point in excess of 100 degrees F. Cleaning shall be programmed so that dust and other contaminants
- 2. Ferrous Surfaces: Ferrous surfaces that have not been shop coated shall be solvent cleaned. Surfaces that contain rust, loose mill scale, and other foreign substances shall be mechanically cleaned by power wire brushing or sandblasting. Minor amounts of residual rust that cannot be removed exept by blast cleaning and tight mill scale that cannot be removed except by applying a sharp knife to any edge will be allowed to remain. After cleaning, one coat of ferrous metal primer shall be applied to all ferrous surfaces to receive paint. The semi-transparent film applied to some pipes and tubing at the mill is not to be considered as a shop coat, but shall be overcoated with the specified ferrous metal primer prior to application of finish coats. Shop coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately

will not fall on wet, newly painted surfaces.

upon detection. 3. Galvanized and Nonferrous Surfaces: Galvanized, aluminum and aluminum alloy, lead, copper and other nonferrous surfaces to be painted shall be solvent cleaned and treated with vinyl type wash coat.

- 4. Gypsum Board Surfaces: Shall be dry and shall have all loose dirt and dust removed by brushing with a soft brush
- or rubbing with a dry cloth prior to application of the first coat material.
- 5. Mastic Type Surfaces: Shall be prepared by removing
- foreign material. 6. Wood Surfaces: Shall be cleaned of foreign matter. Wood surfaces adjacent to surfaces to receive water thinned paints shall be primed and/or touched-up prior to the application of such paints. Surfaces shall be checked to insure that finishing nails have been properly set and all holes and surface imperfections shall be primed. After priming all holes and imperfections in finish surfaces shall be filled with putty or plastic wood filler, colored to match the finish coat if antural finish is required, allow to dry, and sandpaper smooth. Wood trim shall be back primed. Putty or wood filler used shall be compatible with subsequent coatings. Painting shall proceed when the moisture content of the wood does not exceed 12% as measured by a moisture meter.
- 7. Metal Surfaces: Contractor shall verify compatibility of paint system specified herein with factory primer or factory finish. In case of conflict, Contractor shall apply equivalent, compatible paint system at no increase in the Contract Sum and not extension of Contract Time.

Application:

- A. Paint may be applied by brush, roller, or spray, except as hereinafter specified. At time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.
- drops, ridges, waves, laps, brush marks, and variations in color, texture and finish. Each coat shall be applied as a film of uniform C. Rollers for applying paints and enamels shall be of a type

B. Paint shall be applied so finish surfaces shall be free of runs,

D. Special attention shall be given to insure that all surfaces including edges, corners and crevices, welds, and rivets receive

designed for the coating to be applied and the surface to be

- a film thickness equivalent to that of adjacent surfaces. E. Adequate ventilation shall be provided during paint application. Adjacent areas shall be protected by the use of drop cloths or other approved precautionary measures shall be taken.
- F. The first coat on gypsum wallboard and other surfaces shall include repeated touching up suction spots or overall applications of primer or sealer to produce a uniform color and gloss. G. The first coat on both faces of wood doors shall be applied at essentially the same time. Paints, except where water thinned
- types, shall be applied only to surfaces that are completely free of surface moisture, as determined by sight and touch. H. Coating progress: sufficient time shall elapse between successive coats to permit proper drying. This period shall be
- modified as necessary to suit adverse weather conditions. Time between surface preparation and painting: Surfaces that have been cleaned, pretreated, and otherwise prepared for painting shall be given a coat of the specific first coat as soon as practicable after such pretreatment has been complete, but prior to any deterioration of the prepared surface.
- J. Interior painting: 1. All exposed items or surfaces (except items or surfaces specified not to be painted) shall be painted to match background adjacent colors unless color schedule indicates otherwise. Such items shall include, but not limited to, brackets, piping, conduit, access panels, unfinished or prime coated hardware, grills louvers, registers, fire equipment cabinets, electrical

panels, speaker enclosures, and any other similar items.

SECTION 09900 - PAINT (CONTINUED)

- 2. Hardware and fixtures: Hardware, hardware accessories, plate, lighting fixtures and similar items in place shall be removed prior to painting and replaced upon completion of each space. Heating and other equipment adjacent to walls shall be disconnected; using workman skilled I appropriate trades and moved to permit wall surfaces to be painted. Following completion of painting, they shall be
- expertly replaced and reconnected.
- 7. Surfaces not to be painted. Exposed Masonry
- Items having complete factory finish. Anodized aluminum, stainless steel, chromium plate, glass, copper, bronze or similar materials. Moving parts, valves, operating units, mechanical and electrical
- parts such as valve and damper operators, sending devices, motor and fan shafts. E. Code labels, equipment identification, or rating plates, fusible
- links, and sprinkler heads. F. Do not paint over Underwriter's Label.
- Quality and Finish of Work: A. All work may be inspected for proper surface preparation, pretreatment, priming, dry film thickness, curing, color, and

workmanship

END OF SECTION

SECTION 10800: TOILET ACCESSORIES

- PART-1 GENERAL 1.1 SCOPE OF WORK A. Provide labor, materials, equipment, and supervision with incidental services necessary to complete all toilet room accessories work as
- 1. Providing toilet accessories and mirrors as indicated on the drawings. 1.2 SUBMITTALS

A. Product List: Name the manufacturers and full identifying product

indicated by the drawings and specified herein, including:

names and catalog numbers B. Samples: Submit upon request. Approved samples will be returned to be incorporated in the work. Label samples properly to facilitate their submittal and return. C. Product Data: Provide details, rough-in dimensions for recessed

items, mounting heights above finish floor, and connections to other

construction. Include manufacturer's installation instructions. Include

N.I.C. by Owner

As specified in drawings

- a schedule of toilet accessories. PART 2 - PRODUCTS
- 2.1 MANUFACTURERS A. Toilet accessories shall be manufactured by Bradley, Inc. or
- approved equal. 2.2 MATERIALS AND FABRICATION A. Toilet Rooms
 - 1. Grab Bars: 812 Series SA70 Series 2. Anti-ligature Grab Bars: 3. Toilet Tissue Dispensers: N.I.C. (by Owner) 4. Towel Dispenser: N.I.C. (by Owner)
- PART 3 INSTALLATION: A. Furnish and install blocking as required for installation of

6. Surface Mounted Mirror:

5. Soap Dispensers:

- toilet accessories. Install with tamper proof fasteners.
- Installation shall conform with requirements of the Americans with Disabilities Act (ADA) and state and local



33668 BARTOLA DRIVE STERLING HEIGHTS

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PROJECT NAME:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S **BIDS & PERMITS**

SCHEMATIC DESIGN 11/16/23 DESIGN DEVELOPMENT OWNER REVIEW 11/20/23 FINAL REVIEW 12/08/23 OWNER REVIEW 01/19/24 02/12/24 EGAL REVIEW

19 SEPT. 2023

CONSTRUCTION

DRAWN BY:

CHECKED BY:

REVISIONS:

PERMITS & BIDS

Specs.

General

GENERAL NOTES - DEMOLITION FLOOR PLAN:

- 1. ALL DEMOLITION DRAWINGS AND DEMOLITION DETAILS ARE PROVIDED TO SHOW THE GENERAL SCOPE OF THE DEMOLITION WORK, BUT ARE NOT TO BE CONSIDERED AS 100% COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL DEMOLITION WORK NECESSARY TO ACCOMPLISH NEW WORK. THE DEMOLITION DRAWINGS AND DETAILS MAY NOTE TYPICAL ITEMS IN SOME AREAS, WHICH APPLY IN OTHER AREAS (AND ARE DESIGNATED WITH DASHED, HIDDEN OR STRUCK THRU LINES). COORDINATE ALL DEMOLITION WORK WITH ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. REFER TO THESE DRAWINGS FOR ADDITIONAL DEMOLITION WORK AS REQUIRED.
- 2. ALL CONSTRUCTION AND DEMOLITION MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 3. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS PRIOR TO SUBMITTING BID.
- 4. PROVIDE PROTECTION FOR EXISTING CONSTRUCTION TO REMAIN. PATCH AND REPAIR ALL AREAS DAMAGED DURING DEMOLITION/CONSTRUCTION; MATCH EXISTING CONSTRUCTION, MATERIALS AND FINISHES (TYPICAL ALL LOCATIONS).
- 5. ASBESTOS AND OTHER HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER PRIOR TO START OF CONSTRUCTION. IF ANY SUSPECTED HAZARDOUS MATERIAL IS ENCOUNTERED, STOP WORK IN THAT AREA AND IMMEDIATELY CONTACT THE ARCHITECT/OWNER FOR DIRECTION FROM OWNER'S ABATEMENT CONSULTANT.
- 6. REMOVE ALL EXISTING CONSTRUCTION AS NOTED ON DRAWINGS AND ALL CONSTRUCTION AND MATERIALS WHICH ARE INCIDENTAL TO THE PROPOSED NEW CONSTRUCTION WORK.
- 7. ALL CONSTRUCTION DEMOLITION AND DEBRIS ARE TO BE PROMPTLY AND LEGALLY DISPOSED OF OFF SITE.
- 8. ALL RAW EDGES RESULTING FROM DEMOLITION WORK SHALL BE PREPARED TO MATCH EXISTING CONSTRUCTION AND PROVIDE FINISH CONSTRUCTION.
- 9. IN AREAS INDICATED FOR DEMOLITION REMOVE ALL LIGHT FIXTURES, LIGHT SWITCHES, CONVENIENCE OUTLETS ETC. AND ALL RELATED WIRING AND CONDUIT BACK TO PANEL SOURCE, COORDINATE WITH ELECTRICAL PLANS, TYPICAL
- 10. AT AREAS INDICATED FOR DEMOLITION ALL PLUMBING FIXTURES TO BE REMOVED SHALL HAVE PLUMBING LINES CAPPED BELOW EXISTING SLAB AND PATCH TO MATCH EXISTING, COORDINATE WITH MECHANICAL PLANS, TYPICAL.
- 11. DIMENSIONS SHOWN FOR DEMOLITION AND AREAS ARE APPROXIMATE ONLY. CONTRACTOR SHALL COORDINATE FULL EXTENTS OF DEMOLITION IN THESE AREAS.
- 12. CONFIRM EXTENT OF DEMOLITION WITH SCOPE OF NEW WORK.
- 13. WALL REMOVAL THAT TERMINATES INTO A WALL OR CEILING TO REMAIN SHALL BE COMPLETELY REMOVED, FREE OF PROJECTIONS, READY TO RECEIVE NEW FINISHES.
- 14. CONTRACTOR SHALL REMOVE EXISTING DOORS, FRAMES AND ALL ASSOCIATED MATERIAL AS REQUIRED FOR NEW CONSTRUCTION. PREP OPENING REFER TO FLOOR PLAN. (VIF)
- 15. CONTRACTOR SHALL PLACE ANY ITEMS OR MATERIALS TO BE SALVAGED AND/OR RETAINED AS DIRECTED BY OWNER.
- 16. PATCH AND REPAIR ALL SURFACES TO REMAIN TO MATCH EXISTING ADJACENT SURFACES AS REQUIRED TO RECEIVE NEW FINISHES
- 17. REMOVE EXISTING UNUSED NAILS, SCREWS AND OTHER WALL PROTRUSIONS FROM EXISTING SURFACES TO REMAIN. PATCH AND REPAIR TO MATCH EXISTING ADJACENT SURFACES AS REQUIRED TO RECEIVE NEW FINISHES.
- 18. REMOVAL OF ANY MECHANICAL, ELECTRICAL AND MISCELLANEOUS ITEMS WILL REQUIRE PATCH AND REPAIR OF ADJACENT MATERIALS TO REMAIN.
- 19. DISCONNECT ALL MISCELLANEOUS FEATURES (I.E. ELECTRICAL, MECHANICAL, PLUMBING, ETC.) ASSOCIATED WITH ITEMS TO BE DEMOLISHED (I.E. PARTITIONS, WALLS, CEILINGS, CABINETS ETC.).

DEMOLITION KEY NOTES:

AND PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS.

NOTE:
COORDINATE WITH ELECTRICAL DRAWING PLANS AND SPECIFICATIONS FOR REMOVAL, DEMOLITION, AND RELOCATION OF ELECTRICAL POWER, LIGHTING FIXTURES AND EQUIPMENT AND PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS.

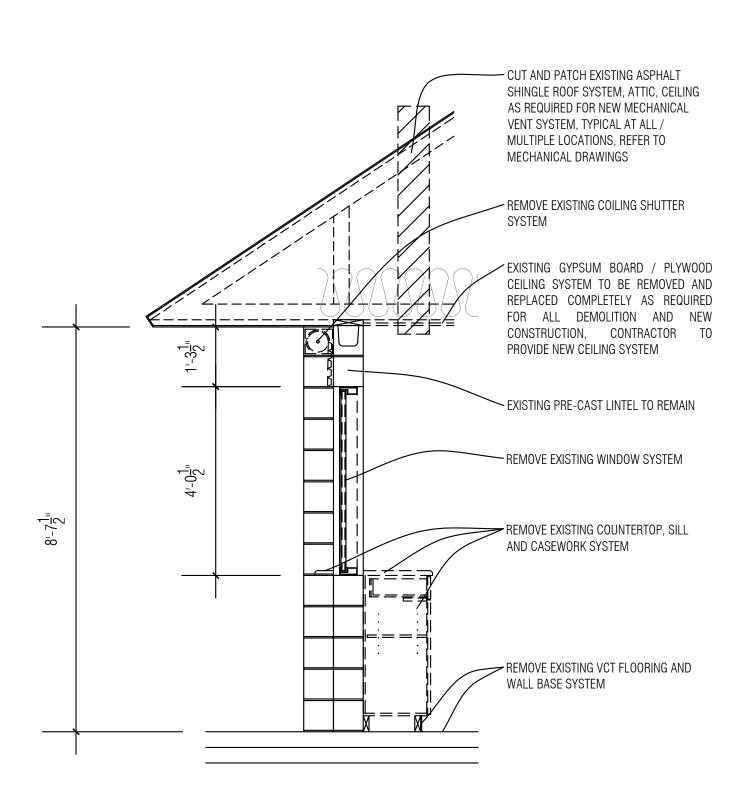
NOTE:
COORDINATE WITH MECHANICAL / PLUMBING DRAWING PLANS AND SPECIFICATIONS FOR REMOVAL, DEMOLITION AND RELOCATION OF MECHANICAL FANS, FIXTURES AND EQUIPMENT AND PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS.

FREE FOR NEW CONSTRUCTION, TEFICAL AT ALL LOCATIONS.

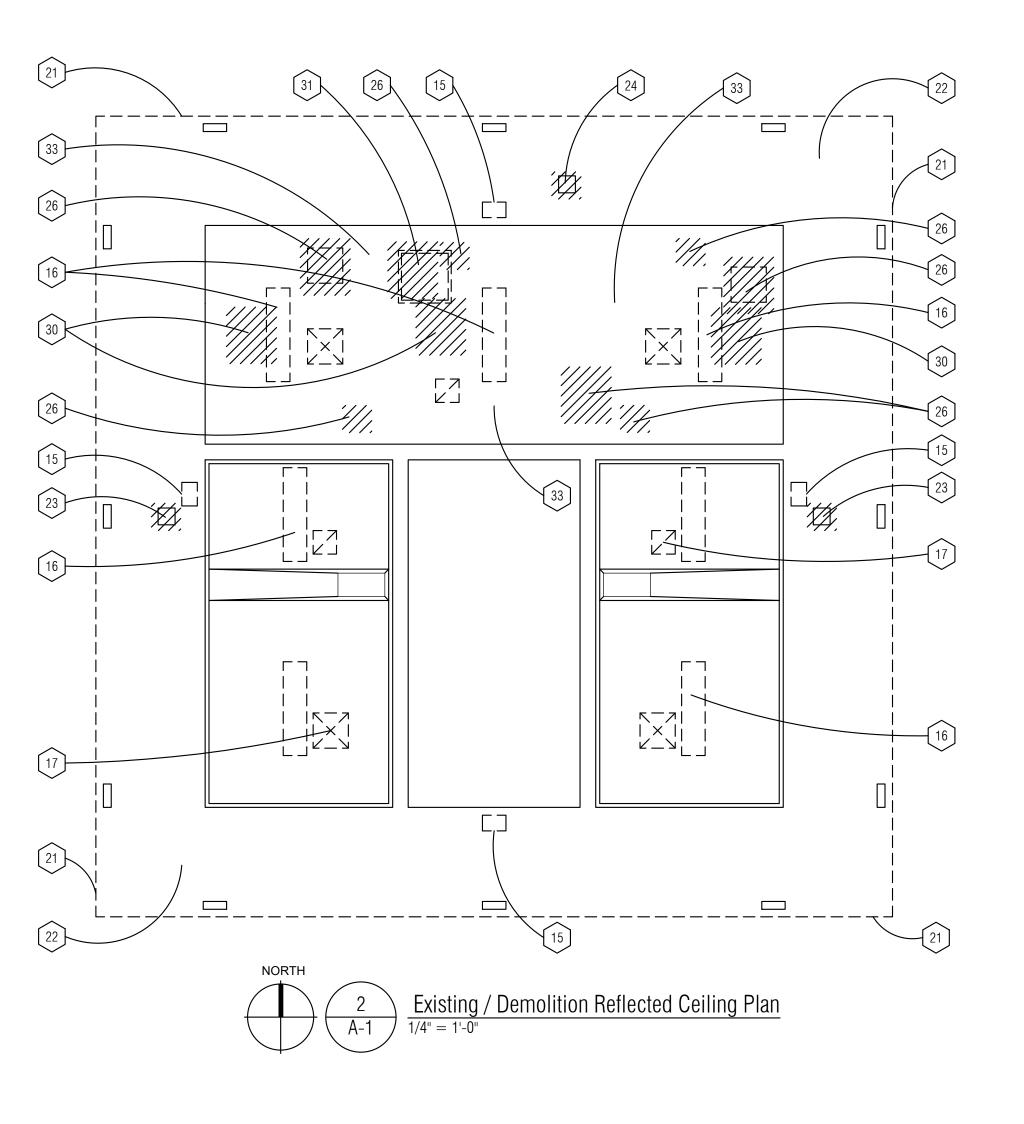
COORDINATE WITH STRUCTURAL DRAWING PLANS AND SPECIFICATIONS FOR REMOVAL, DEMOLITION AND RELOCATION OF STRUCTURAL FRAMING, DECKING, FLOORING AND ROOFING

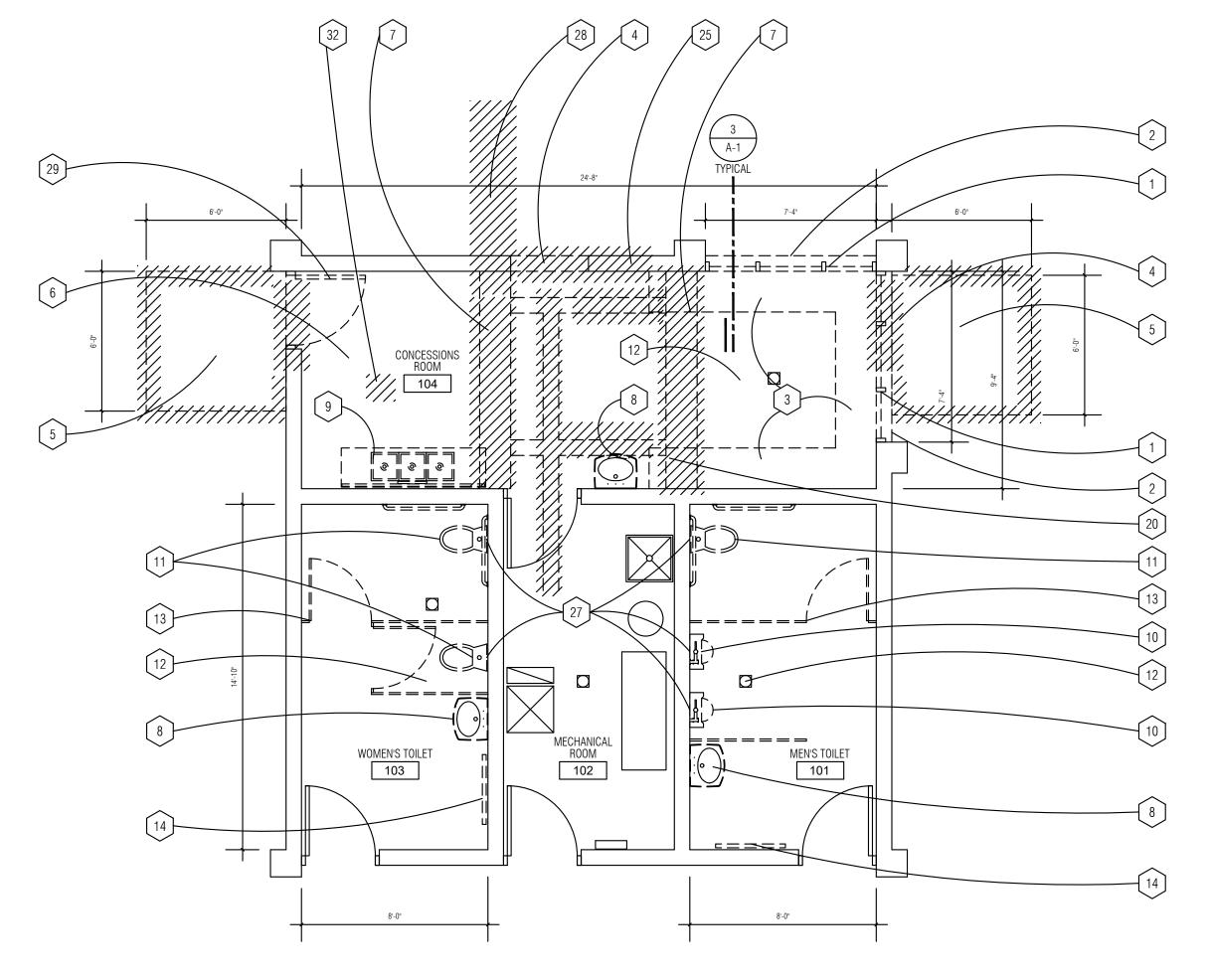
- REMOVE EXISTING ALUMINUM WINDOW FRAME SYSTEM, (NOTE EXISTING PRE-CAST REINFORCED CONCRETE LINTEL SYSTEM TO REMAIN) WINDOW ANCHORS AND ALL BLOCKING TO BE REMOVED COMPLETE. PREP AREA AS REQUIRED FOR NEW WALL INFILL CONSTRUCTION
- REMOVE OVERHEAD COILING SHUTTER SYSTEM, ANCHORS AND ALL BLOCKING COMPLETE, PATCH AND REPAIR EXISTING WALL CONSTRUCTION TO REMAIN, PREP AREA AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE EXISTING COUNTERTOP, SERVICES WINDOW SILL AND ALL BUILT IN CASE WORK, ANCHORS AND ALL BLOCKING COMPLETE, PATCH AND REPAIR EXISTING WALL CONSTRUCTION TO REMAIN, PREP AREA AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE EXISTING PORTION OF EXTERIOR CMU WALL AND PREP OPENING FOR NEW DOOR SYSTEM AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE EXISTING CONCRETE SIDEWALK AND EARTH AS REQUIRED FOR NEW CONSTRUCTION OF SUPPORTED FROST SLAB SYSTEM
- REMOVE VCT FLOORING AND RUBBER BASE IN EXISTING CONCESSION ROOM, PREP AREA AS REQUIRED FOR NEW CONSTRUCTION
- SAW CUT AND REMOVE EXISTING CONCRETE FLOOR SLAB AS REQUIRED FOR NEW SUPPORTED SLAB FOUNDATION SYSTEM AND UNDERGROUND PLUMBING, PATCH AND REPAIR ALL AREAS AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE EXISTING WALL-HUNG LAVATORY AND ALL ACCESSORIES, PATCH AND REPAIR WALLS, FLOORS, SUPPLY AND SANITARY, CAP ALL PLUMBING AS REQUIRED (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)
- REMOVE EXISTING 3-COMPARTMENT SINK AND COUNTERTOP AND ALL ACCESSORIES, PATCH AND REPAIR WALL, FLOORS, SUPPLY AND SANITARY, CAP ALL PLUMBING AS REQUIRED (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)
- REMOVE, EXISTING WALL HUNG URINAL AND ALL ACCESSORIES, PATCH AND REPAIR WALLS, SUPPLY AND SANITARY, CAP ALL PLUMBING AS REQUIRED (REFER TO MECHANICAL PROPERTY AND SANITARY).
- REMOVE, EXISTING FLOOR MOUNTED TOILETS AND ALL ACCESSORIES, CONTRACTOR WILL BE REQUIRED TO SAW CUT EXISTING CONCRETE FLOOR AND ADJUST SANITARY CONNECTION AS REQUIRED FOR NEW TOILET LOCATION TO MEET ADA DIMENSIONS, PATCH AND REPAIR WALLS, FLOORS, SUPPLY AND SANITARY, CAP ALL PLUMBING AS REQUIRED (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)
- EXISTING FLOOR DRAIN SYSTEM TO REMAIN, CONTRACTOR TO REMOVE, PREP, CLEAN FOR REPLACEMENT (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)

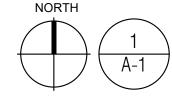
- REMOVE EXISTING FLOOR MOUNTED AND OVERHEAD BRACED TOILET PARTITION SYSTEMS COMPLETE, TYPICAL AT ALL LOCATIONS, ANCHORS AND ALL BLOCKING COMPLETE, PATCH AND REPAIR EXISTING WALL, FLOOR CONSTRUCTION TO REMAIN, PREP AREA AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE ALL EXISTING TOILET ACCESSORIES COMPLETE, TYPICAL AT ALL LOCATIONS (GRAB BARS, PAPER DISPENSERS, HAND DRYERS, MIRRORS, SOAP DISPENSERS, VENDING DISPENSERS ETC.) RETURN EQUIPMENT AND ACCESSORIES TO OWNER AS DIRECTED BY OWNER REP. REMOVE ALL ANCHORS AND ALL BLOCKING COMPLETE, PATCH AND REPAIR EXISTING WALL, FLOOR CONSTRUCTION TO REMAIN, PREP AREA AS REQUIRED FOR NEW CONSTRUCTION
- REMOVE EXISTING EXTERIOR ELECTRICAL WALL PACK LIGHTING FIXTURE AND ALL ACCESSORIES, PATCH AND REPAIR WALLS AS REQUIRED AND PREP FOR NEW CONSTRUCTION (REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS) TYPICAL AT ALL LOCATIONS
- REMOVE EXISTING CEILING MOUNTED ELECTRICAL LIGHT FIXTURE AND ALL ACCESSORIES, PATCH AND REPAIR CEILINGS AS REQUIRED AND PREP FOR NEW CONSTRUCTION (REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SPECIFIC LOCATIONS) TYPICAL AT ALL LOCATIONS
- REMOVE EXISTING SUPPLY AIR DIFFUSERS, RETURN AIR GRILL AND EXHAUST FAN GRILLS AND ALL ACCESSORIES, PATCH AND REPAIR CEILINGS AS REQUIRED AND PREP FOR NEW CONSTRUCTION (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)
- EXISTING WOOD BLOCKING CEILING CROWN MOULDING TO REMAIN, CONTRACTOR TO PROTECT DURING CONSTRUCTION, TYPICAL AT ALL LOCATIONS
- EXISTING SYKLITE ROOF WINDOW SYSTEM TO REMAIN, CONTRACTOR TO PROTECT DURING CONSTRUCTION, TYPICAL AT ALL LOCATIONS
- SAW CUT AND REMOVE EXISTING CONCRETE FLOOR AS REQUIRED FOR NEW UNDER GROUND SANITARY LINE CONNECTION, CONTRACTOR TO PATCH AND REPAIR AS REQUIRED FOR NEW CONSTRUCTION (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS)
- ALL EXPOSED EXISTING HORIZONTAL STEEL ANGLES, ARE TO BE WIRE BRUSHED AND HAND SCRAPED ALONG ALL EXPOSED SURFACES AND EDGES, CONTRACTOR TO POWER SAND AND PREP ALL EXPOSED STEEL, CONTRACTOR TO REPAIR EXISTING STEEL AS REQUIRED FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS
- ALL EXPOSED ROUGH SAWN WOOD SOFFIT BOARD TO BE SANDED AND PREP FOR NEW FINISHES, TYPICAL AT ALL LOCATIONS, (CONTRACTOR TO VERIFY AND REPLACED ANY ROTTED WOOD AS REQUIRED FOR NEW CONSTRUCTION)
- REMOVE EXISTING SOFFIT LOUVER SYSTEM (REFER TO MECHANICAL), PREP AREA AS REQUIRED FOR NEW WOOD SOFFIT INFILL, TYPICAL AT ALL LOCATIONS
- CUT IN AND REMOVE EXISTING SOFFIT AS REQUIRED FOR NEW FRESH AIR INTAKE VENT, REFER TO MECHANICAL DRAWINGS
- 25 CUT OUT AND REMOVE PORTION OF EXISTING CMU WALL AS REQUIRED FOR NEW MECHANICAL LOUVER SYSTEM
- 26 CUT IN AND REMOVE EXISTING PLYWOOD CEILING SYSTEM AS REQUIRED FOR NEW MECHANICAL REGISTER / GRILL, REFER TO MECHANICAL DRAWINGS, TYPICAL AT ALL LOCATIONS
- EXISTING PLUMBING CONTROL LEVERS TO BE REMOVED FROM EXISTING CMU WALL (REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS) CONTRACTOR TO PATCH AND REPAIR WALL AS REQUIRED, TYPICAL AT ALL LOCATIONS
- COORDINATE REMOVAL AND REPLACEMENT OF EXISTING EXTERIOR PAVING AND INSTALLATION OF NEW ELECTRICAL SERVICE FEEDERS AND CONDUITS WITH ELECTRICAL AND CIVIL DRAWINGS AND SPECIFICATIONS AS REQUIRED
- REMOVE EXISTING H.M. DOOR AND FRAME AND PREP OPENING FOR NEW DOOR SYSTEM AS REQUIRED
- CUT IN AND REMOVE EXISTING PLYWOOD CEILING SYSTEM AS REQUIRED FOR NEW ACCESS PANEL (FIELD LOCATED BETWEEN TRUSSES AS REQUIRED), TYPICAL AT ALL LOCATIONS
- EXISTING ACCESS DOOR AND FRAME TO BE REMOVED AND PREP AREA FOR PATCH INFILL AS REQUIRED TO MATCH EXISTING
- CUT EXISTING CONCRETE FLOOR AND TRENCH NEW PATCH FOR NEW CONSTRUCTION OF FLOOR DRAIN SYSTEM, REFER TO MECHANICAL DRAWINGS
- EXISTING CEILING SYSTEM TO BE REMOVED AND REPLACED COMPLETELY AS REQUIRED FOR ALL DEMOLITION AND NEW CONSTRUCTION, CONTRACTOR TO PROVIDE NEW











Existing / Demolition Floor Plan

NOTE: ALL DIMENSIONS ARE APPROXIMATE +/- DIMENSIONS. CONTRACTORS WILL BE RESPONSIBLE TO FIELD VERIFY ALL DIMENSIONS AND LOCATIONS.

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ENGINEER:

PROJECT NAME:

CENTENNIAL PARK STROOMS and PAVILL

SCHEMATIC DESIGN

DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S

BIDS & PERMITS

DRAWN BY:
CHECKED BY: JF

CONSTRUCTION

REVISIONS:

 SCHEMATIC DESIGN
 11/07/23

 DESIGN DEVELOPMENT
 11/16/23

 OWNER REVIEW
 11/20/23

 FINAL REVIEW
 12/08/23

 OWNER REVIEW
 01/19/24

 EGAL REVIEW
 02/12/24

 PERMITS & BIDS
 03/14/24

19 SEPT. 2023

PROJECT NO.: 23-037

DRAWING NAME:

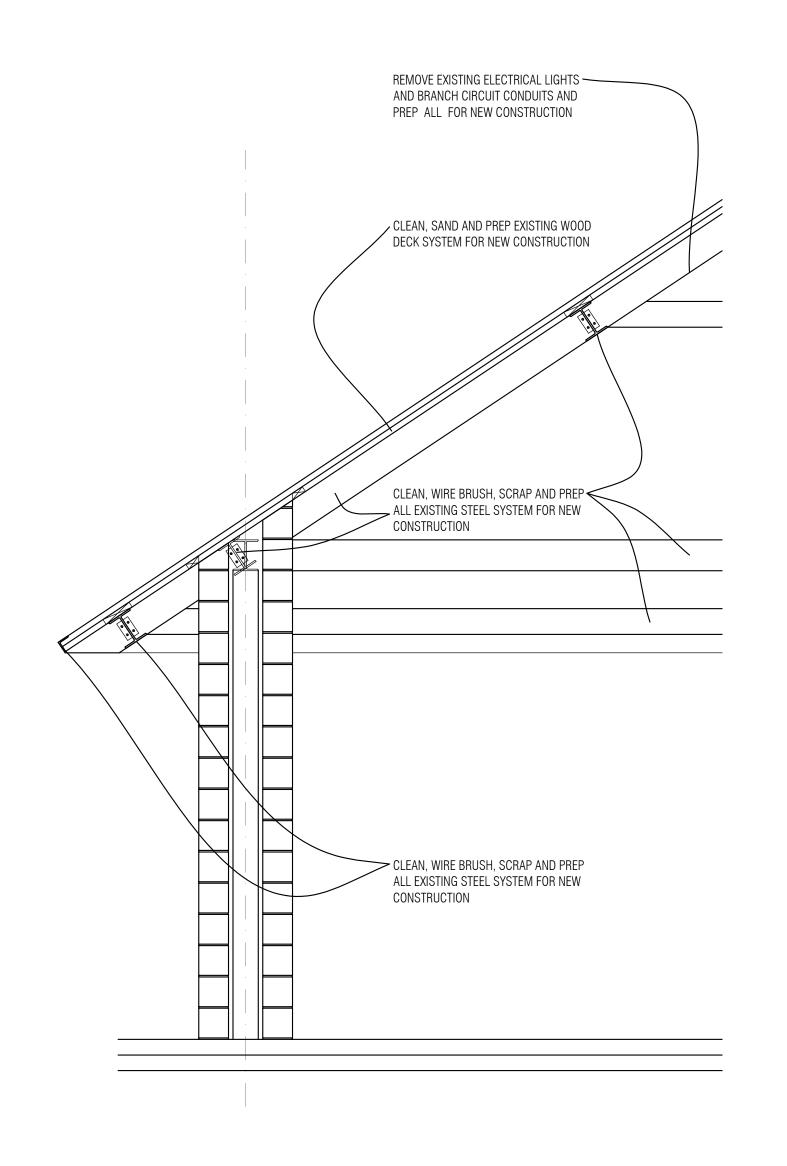
Restroom Demolition Plan

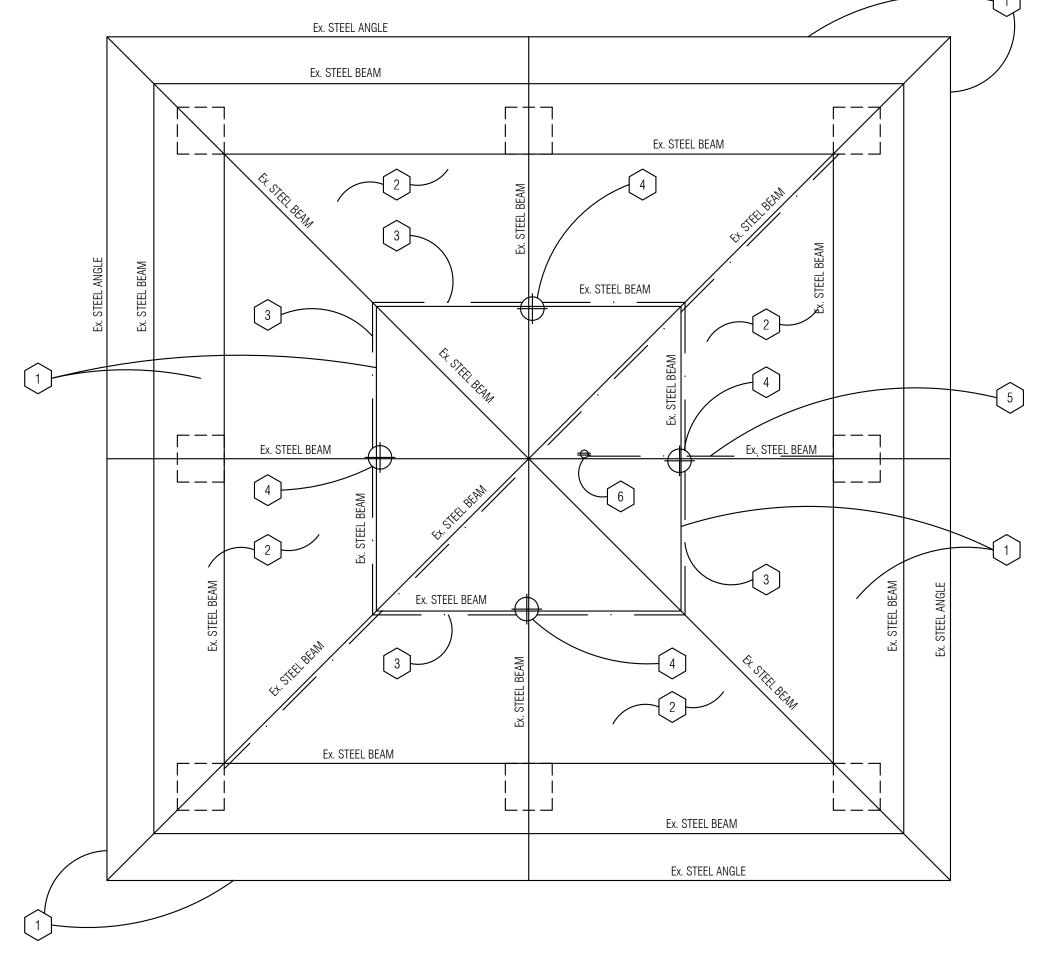
SHEET NO.:

A-1

GENERAL NOTES - DEMOLITION FLOOR PLAN:

- 1. ALL DEMOLITION DRAWINGS AND DEMOLITION DETAILS ARE PROVIDED TO SHOW THE GENERAL SCOPE OF THE DEMOLITION WORK, BUT ARE NOT TO BE CONSIDERED AS 100% COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL DEMOLITION WORK NECESSARY TO ACCOMPLISH NEW WORK. THE DEMOLITION DRAWINGS AND DETAILS MAY NOTE TYPICAL ITEMS IN SOME AREAS, WHICH APPLY IN OTHER AREAS (AND ARE DESIGNATED WITH DASHED, HIDDEN OR STRUCK THRU LINES). COORDINATE ALL DEMOLITION WORK WITH ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. REFER TO THESE DRAWINGS FOR ADDITIONAL DEMOLITION WORK AS REQUIRED.
- 2. ALL CONSTRUCTION AND DEMOLITION MEANS, METHODS AND SAFETY PRECAUTIONS SHALL BE SOLE RESPONSIBILITY OF THE CONTRACTOR.
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- 5. ASBESTOS AND OTHER HAZARDOUS MATERIALS WILL BE REMOVED BY OWNER PRIOR TO START OF CONSTRUCTION. IF ANY SUSPECTED HAZARDOUS MATERIAL IS ENCOUNTERED, STOP WORK IN THAT AREA AND IMMEDIATELY CONTACT THE ARCHITECT/OWNER FOR DIRECTION FROM OWNER'S ABATEMENT CONSULTANT.
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- 9. IN AREAS INDICATED FOR DEMOLITION REMOVE ALL LIGHT FIXTURES, LIGHT SWITCHES, CONVENIENCE OUTLETS ETC. AND ALL RELATED WIRING AND CONDUIT BACK TO PANEL SOURCE, COORDINATE WITH ELECTRICAL PLANS, TYPICAL
- 10. AT AREAS INDICATED FOR DEMOLITION ALL PLUMBING FIXTURES TO BE REMOVED SHALL HAVE PLUMBING LINES CAPPED BELOW EXISTING SLAB AND PATCH TO MATCH EXISTING, COORDINATE
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- 14. CONTRACTOR SHALL REMOVE EXISTING DOORS, FRAMES AND ALL ASSOCIATED MATERIAL AS REQUIRED FOR NEW CONSTRUCTION. PREP OPENING REFER TO FLOOR PLAN. (VIF)
- 15. CONTRACTOR SHALL PLACE ANY ITEMS OR MATERIALS TO BE SALVAGED AND/OR RETAINED AS DIRECTED BY OWNER.
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- 17. REMOVE EXISTING UNUSED NAILS, SCREWS AND OTHER WALL PROTRUSIONS FROM EXISTING SURFACES TO REMAIN. PATCH AND REPAIR TO MATCH EXISTING ADJACENT SURFACES AS REQUIRED TO RECEIVE NEW FINISHES.
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- 19. DISCONNECT ALL MISCELLANEOUS FEATURES (I.E. ELECTRICAL, MECHANICAL, PLUMBING, ETC.) ASSOCIATED WITH ITEMS TO BE DEMOLISHED (I.E. PARTITIONS, WALLS, CEILINGS, CABINETS









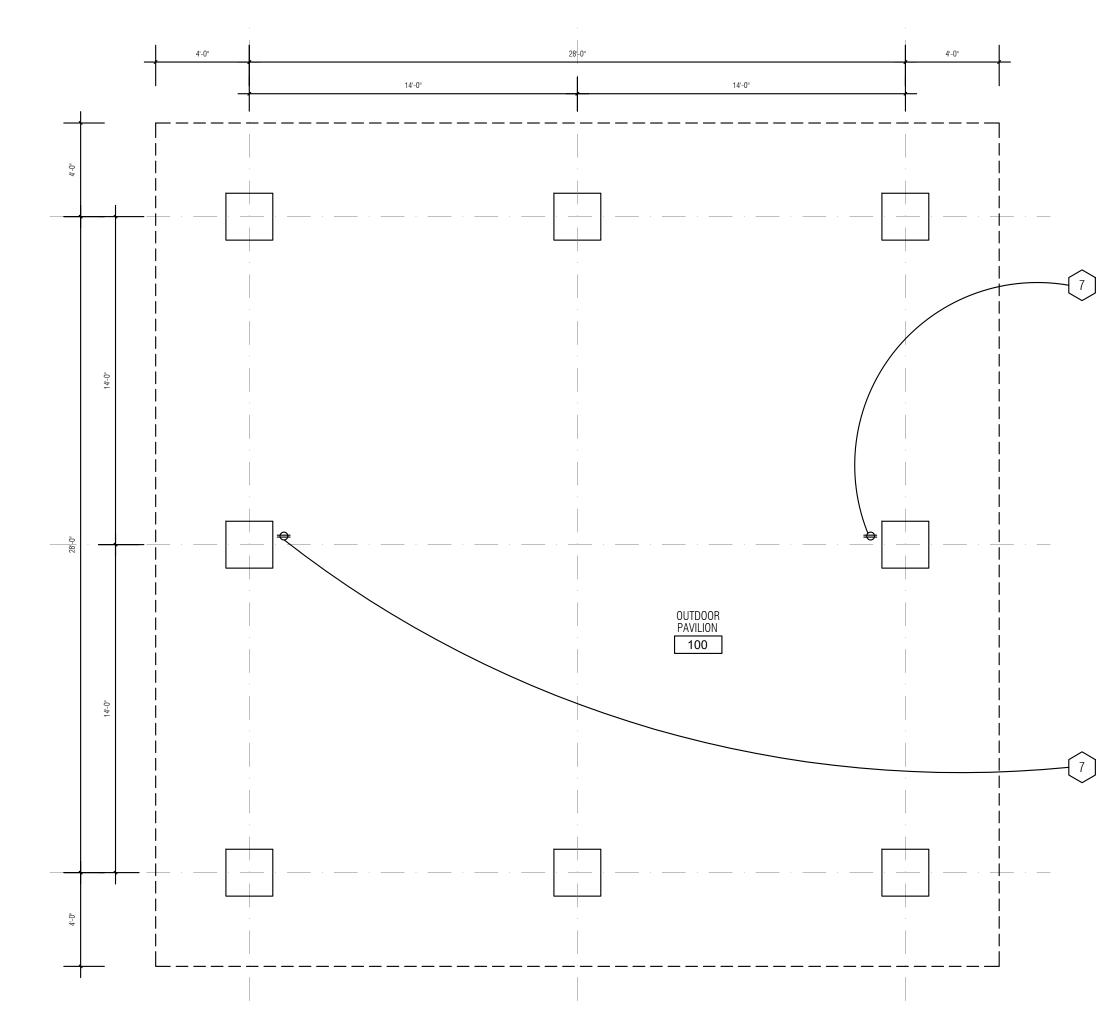
DEMOLITION KEY NOTES:

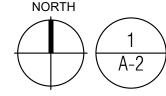
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COORDINATE WITH MECHANICAL / PLUMBING DRAWING PLANS AND SPECIFICATIONS FOR REMOVAL, DEMOLITION AND RELOCATION OF MECHANICAL FANS, FIXTURES AND EQUIPMENT AND PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS.

COORDINATE WITH STRUCTURAL DRAWING PLANS AND SPECIFICATIONS FOR REMOVAL, DEMOLITION AND RELOCATION OF STRUCTURAL FRAMING, DECKING, FLOORING AND ROOFING AND PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS.

- ALL EXPOSED EXISTING HORIZONTAL AND SLOPED STEEL BEAMS, ANGLES, COLUMNS, PLATES, BRACKETS, BOLTS ARE TO BE WIRE BRUSHED AND HAND SCRAPED ALONG ALL EXPOSED SURFACES AND EDGES, CONTRACTOR TO POWER SAND AND PREP ALL EXPOSED STEEL, CONTRACTOR TO REPAIR EXISTING STEEL AS REQUIRED FOR NEW CONSTRUCTION, TYPICAL AT ALL
- ALL EXPOSED EXISTING TONGUE AND GROOVE HORIZONTAL AND SLOPED WOOD DECKING AND TRIM TO BE SANDED AND PREP FOR NEW FINISHES AND CONSTRUCTION, CONTRACTOR TO REPAIR ALL ROTTED WOOD AS REQUIRED FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS
- EXISTING ELECTRICAL LIGHTING CONDUIT TO BE REMOVED, CONTRACTOR TO CAP AND DISCONNECT EXISTING LIGHTING CIRCUIT AND TO PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL EXISTING LIGHTING LOCATIONS
- REMOVE EXISTING ELECTRICAL LIGHTING CEILING PACK LIGHT FIXTURES, CONTRACTOR TO CAP AND DISCONNECT ELECTRICAL BRANCH WIRING AS REQUIRED FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS
- EXISTING POWER CONDUIT TO BE REMOVED, CONTRACTOR TO RELOCATE EXISTING POWER CIRCUIT AND TO PREP FOR NEW CONSTRUCTION
- REMOVE EXISTING CEILING POWER OUTLET JUNCTION BOX, CONTRACTOR TO RELOCATE POWER OUTLET JUNCTION BOX, CONTRACTOR TO PREP FOR NEW CONSTRUCTION
- REMOVE EXISTING DAMAGED ELECTRICAL WALL OUTLET, PREP FOR NEW CONSTRUCTION, TYPICAL AT ALL LOCATIONS





Existing / Demolition Floor Plan

NOTE: ALL DIMENSIONS ARE APPROXIMATE +/- DIMENSIONS. CONTRACTORS WILL BE RESPONSIBLE TO FIELD VERIFY ALL DIMENSIONS AND LOCATIONS.

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ENGINEER:

PROJECT NAME:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S BIDS & PERMITS

CONSTRUCTION DRAWN BY: CHECKED BY:

SCHEMATIC DESIGN
DESIGN DEVELOPMENT OWNER REVIEW FINAL REVIEW OWNER REVIEW EGAL REVIEW PERMITS & BIDS

19 SEPT. 2023

Pavilion Demolition Plan

GENERAL NOTES:

- 1. ALL PLAN DIMENSIONS ARE NOMINAL TO FACE OF WALL. WALL THICKNESS ARE SHOWN NOMINAL SEE WALL TYPES FOR ACTUAL THICKNESS
- 2. COORDINATE SIZE AND LOCATION OF ALL DUCT AND SHAFT OPENINGS IN WALLS. CEILINGS AND FLOORS WITH MECHANICAL AND ELECTRICAL. PROVIDE ALL REQUIRED LINTELS FOR OPENINGS.
- 3. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.
- 4. ALL WORK SHALL COMPLY WITH NATIONAL, STATE AND LOCAL CODES, ORDINANCES AND REGULATIONS.
- 5. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR VISITING THE JOB SITE AND FAMILIARIZING THEMSELVES WITH EXISTING CONDITIONS PRIOR TO START OF WORK. ALL DIMENSIONS AND FIELD CONDITIONS SHALL BE VERIFIED, AND ARCHITECT NOTIFIED OF ANY DISCREPANCIES PRIOR TO THE RECEIPT OF BIDS. FAILURE OF THE CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO THE AWARD OF BID WILL NOT BE CONSIDERED AS GROUNDS FOR AN EXTRA.
- 6. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE PERFORMANCE OF THE CONTRACT. PROVIDE ALL NECESSARY TEMPORARY PROTECTION TO ENSURE THE SAFETY OF THE WORKERS AND GENERAL PUBLIC DURING CONSTRUCTION.
- 7. ALL ITEMS SHALL BE AS SPECIFIED BY ARCHITECT AND ENGINEER AND AS APPROVED BY THE OWNER.
- 8. SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES TO THE ARCHITECT AND OWNER FOR REVIEW PRIOR TO
- 9. ALL DEBRIS SHALL BE LEGALLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR.
- ALL PRECAUTIONS SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING MATERIALS AND CONSTRUCTION TO REMAIN.
- 11. CONTRACTOR SHALL KEEP NOISE, DUST, ETC., TO A MINIMUM STANDARD AS SET FORTH BY THE OWNER.
- 12. CONTRACTOR SHALL COORDINATE INSTALLATION AND PHASING OF WORK WITH THE OWNER'S REPRESENTATIVE PRIOR TO THE START OF WORK.
- 13. NOTE ALL DIMENSIONS ARE + / AND ARE TO BE FIELD VERIFIED

SPACE AREA REQUIREMENTS FOR MANEUVERING

- 14. CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL NEW WORK AS REQUIRED FOR ELECTRICAL AND MECHANICAL WITH ARCHITECTURAL IF A CONFLICT IS ENCOUNTERED, REQUEST CLARIFICATIONS FROM THE ARCHITECT. REFER TO ELECTRICAL PLANS FOR LIGHT FIXTURE TYPES, LOCATIONS AND SPECIFICATIONS. REFER TO MECHANICAL PLANS FOR DIFFUSER, REGISTERS AND RETURN GRILLES TYPES, LOCATIONS AND SPECIFICATIONS. REFER TO STRUCTURAL FOR NEW SYSTEMS DETAILS AND SPECIFICATIONS
- 15. CONTRACTOR SHALL CUT AND PREP AND PATCH ALL EXISTING WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO COMPLETE THE

ADA FLOOR CLEARANCE REQU'D.:

- CIRCLE DASH LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 60" MINIMUM DIAMETER TURNING RADIUS CLEAR SPACE AREA REQUIREMENTS FOR MANEUVERING WITH IN ROOM
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 59" x 60" MINIMUM FOR TOILET CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 60" x 60" MINIMUM FOR TOILET CLEARANCE SPACE AREA
- REQUIREMENTS FOR MANEUVERING RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 30" x 48" MINIMUM FOR WALL MTD. LAVATORY / SINK CLEARANCE
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 30" x 48" MINIMUM FOR SEMI-RECESSED WALL MTD. HAND DRYER CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 20" x 36" MINIMUM FOR WALL MTD. BABY CHANGING STATION CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 30" x 48" MINIMUM FOR WALL MTD. URINAL CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 58" x 60", "FRONT APPROACH, (18" CLEAR ON STRIKE SIDE) PULL
- RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 64" x 54", "LATCH SIDE APPROACH, (24" CLEAR ON STRIKE SIDE)
- PULL SIDE" CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING AT ROOM EXIT DOOR

RECTANGLE DASHED LINE IDENTIFIES ON FLOOR PLAN REPRESENTS ADA 48" x 52", "FRONT APPROACH, (12" CLEAR ON STRIKE SIDE) PUSH

TOILET ACCESSORIES LEGEND:

SIDE" CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING AT ROOM EXIT DOOR

SIDE" CLEARANCE SPACE AREA REQUIREMENTS FOR MANEUVERING AT ROOM EXIT DOOR

- TA-1 36" GRAB BAR (BOBRICK #B-6806.99 SERIES OR EQUAL)
- 42" GRAB BAR (BOBRICK #B-6806.99 SERIES OR EQUAL)
- 18" VERTICAL GRAB BAR (BOBRICK #B-6806.99 SERIES OR EQUAL)
- FRAMED MIRROR AND SHELF COMBINATION (24"W X 36"H) (BOBRICK #B-166-2436 SERIES OR EQUAL)
- ADA LOCATION FRAMED MIRROR (24"W X 60"H) (BOBRICK #B-290-2460 SERIES OR EQUAL)
- UNDER LAVATORY PROTECTIVE WRAP GUARDS (TRAPWRAP BY BROCAR PRODUCTS INC.)
- WALL MTD. SANITARY DISPOSAL (BOBRICK #B-270)
- WALL MTD. SANITARY DISPENSER (INPACT PRODUCTS J6RC25 DUAL NAPKIN & PAD DISPENSER #25191000)
- ROBE CLOTHS HOOK WALL MOUINTED (BOBRICK #B-76717 OR EQUAL)
- SURFACE FACE WALL MTD. SOAP DISPENSER (BOBRICK #B-5050 OR EQUAL)
- CHILD SAFETY SEAT / PROTECTION SEAT FOLD DOWN (KOALA #KB-102-00 WALL MOUNTED OR EQUAL)
- TA-13 BABY CHANGING STATION FOLD DOWN (KOALA #KB-310-SSWM HORIZONTAL WALL MOUNTED OR EQUAL)
- TA-14 WALL MOUNTED HAND DRYER (EXCEL XLERATOR #XL-SB) WITH ADA COMPLIANT RECESS KIT #40502 WITH ANTI-MICROBAIL WALL SPLASH GUARD Size: 31-3/4" L x 15-3/4" W x 1/16" D(EXCEL #89S)

REFLECTED CEILING PLAN KEY NOTES:

CONTRACTOR TO COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR, DIFFUSERS AND GRILLES, LIGHT FIXTURE TYPES, ELECTRICAL EQUIPMENT LOCATIONS AND DETAILS, COORDINATE WITH NEW ARCHITECTURAL WORK, ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT, TYPICAL AT ALL ROOMS AND LOCATIONS

- PATCH AND REPAIR EXISTING GYPSUM BOARD CEILING, PROVIDE NEW PRIMED AND EPOXY PAINTED, FINAL COLOR SELECTION BY OWNER, TYPICAL AT ALL LOCATIONS
- EXISTING CEILING "FRP" PANEL SYSTEM TO REMAIN, CONTRACTOR TO VERIFY AND SECURE EXISTING ATTACHMENT AS REQUIRED
- PRIME AND EPOXY PAINT EXISTING WOOD CROWN MOLDING TRIM, TYPICAL AT ALL LOCATIONS AROUND PERIMETER OF
- PRIME AND EPOXY PAINT GYPSUM BOARD SKYLIGHT LIGHT WELL, TYPICAL AT ALL LOCATIONS
- EXISTING SKYLIGHT TO REMAIN, CONTRACTOR TO CLEAN UP AS REQUIRED FOR NEW WORK, TYPICAL AT ALL LOCATIONS
- NO WORK THIS AREA, EXISTING CEILING SYSTEM TO REMAIN CONTRACTOR TO PROTECT DURING NEW CONSTRUCTION
- PROVIDE NEW / REPLACED SUPPLY AIR DIFFUSER, RETURN AIR GRILL, EXHAUST FAN GRILL, CONTRACTOR TO VERIFY IN FIELD, PATCH / REPAIR AND PAINT EXISTING CEILING, TYPICAL AT ALL LOCATIONS, REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS
- PROVIDE NEW LED LIGHT FIXTURE ON SURFACE MOUNTED CEILING SYSTEM, REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS
- EXISTING CEILING ACCESS DOOR TO BE REMOVED AND INFILLED AND PATCHED TO MATCH EXISTING CEILING SYSTEM CONTRACTOR TO RE-PAINT FINISH TO MATCH NEW CEILING PAINT COLOR . TYPICAL AT ALL LOCATIONS
- PRIME AND REPAINT EXISTING STEEL ANGLE AROUND FULL PERIMETER OF ROOF SOFFIT / EAVE LINE, TYPICAL AT ALL LOCATIONS
- SAND, PRIME AND REPAINT ALL EXISTING AND NEW ROUGH SAWN WOOD SOFFIT, (CONTRACTOR TO INSPECT AND REPLACED ALL ROTTED WOOD AS REQUIRED FOR ERE-FINISHING) OWNER TO SELECT COLOR, TYPICAL AT ALL LOCATIONS
- INFILL PATCH AND REPAIR EXISTING SOFFIT WITH NEW ROUGH SAW PLYWOOD TO MATCH AT LOCATIONS OF REMOVE EXISTING EXHAUST FAN LOUVER, PRIME AND PAINT TO MATCH EXISTING, TYPICAL AT ALL LOCATIONS
- LOCATION OF NEW PRE-FINISHED LOUVER SYSTEM IN EXISTING SOFFIT, CONTRACTOR TO FIELD LOCATE AS NECESSARY, PATCH AND PAINT SOFFIT AS REQUIRED
- PROVIDE NEW PAINTED FLUSH ACCESS DOOR 24" x 24" BY "JL" INDUSTRIES ACTIVAR MODEL #TM 16 GA STEEL WITH 1"
- FLANGE WITH SCREWDRIVER LOCKING CAM, TYPICAL AT ALL 3 LOCATIONS. PAINT TO MATCH CEILING FINISH AND COLOR
- NEW SOFFIT VENT AND LOUVER CUT INTO EXISTING SOFFIT FROM NEW MECHANICAL SYSTEM, CAULK PERIMETER, PATCH AND REPAIR SOFFIT, REFER TO MECHANICAL PLANS AND SPECS, TYPICAL
- NEW EMERGENCY BATTERY LIGHTING SYSTEM, REFER TO ELECTRICAL PLANS AND SPECIFICATIONS, TYPICAL AT ALL LOCATIONS
- NuFIBER FIBERLITE 0.090 FRP CEILING PANEL LAMINATED TO 1/2" EXTERIOR PLYWOOD SHEATHING MODEL #F3P500,

MOISTURE AND IMPACT RESISTANCE CLASS "A" FIRE RATING WASHABLE SURFACE DIRECTLY FASTEN TO UNDERSIDE OF ROOF TRUSSES, (OWNER TO SELECT FROM MANUFACTURES STANDARD 16 COLORS AND 2 TEXTURES) LOCATED IN NEW RESTROOMS AND STORAGE ROOM AT LOCATION OF REMOVED GYP BOARD CEILING

6r

FLOOR PLAN KEY NOTES:

COORDINATE WITH ELECTRICAL DRAWING PLANS AND SPECIFICATIONS FOR NEW WORK SCOPE OF ELECTRICAL POWER, LIGHTING FIXTURES AND EQUIPMENT, TYPICAL AT ALL LOCATIONS.

COORDINATE WITH MECHANICAL / PLUMBING DRAWING PLANS AND SPECIFICATIONS FOR NEW WORK SCOPE OF MECHANICAL FANS. FIXTURES AND EQUIPMENT. TYPICAL AT ALL LOCATIONS.

PROVIDE NEW 6'-0" x 6'-0" X 42" DEEP MIN. FROST / FREEZE SLAB AT EXTERIOR ENTRY DOOR LOCATIONS, REFER TO DETAILS

NEW HOLLOW METAL DOOR AND FRAME SYSTEM WITH PRIVACY HARDWARE SYSTEM

PROVIDE 1 EA. CONTINUES HINGES #780 112HD BY HAGER WITH ALUM FINISH, 1 EA. MORTISE LOCKESET #3896 SECT. ARC BY HAGER WITH US26 FINISH AND SMALL FORMATTED INTERCHANGEABLE CORE (SFIC) WITH 1 EA THRESHOLD 425 BY NGP WITH ALUM FINISH WITH 1 EA. SWEEP #675A BY NGP. KEYING TO MATCH OWNERS EXISTING SYSTEM, PROVIDE ALLEGION #4CY. PROVIDE ALLEGION F15 L9486/LV9486 FACILITY RESTROOM LOCK WITH "DO NOT DISTURB" INDICATOR. (LATCHBOLT RETRACTED BY KEY OUTSIDE BY LEVER INSIDE. OUTSIDE LEVER ALWAYS FIXED. DEADBOLT THROWN OR RETRACTED BY INSIDE THUMBTURN. WHEN DEADBOLT IS THROWN. "DO NOT DISTURB" PLATE IS DISPLAYED. ALL KEYS BECOME INOPERATIVE EXCEPT EMERGENCY KEY. TURNING INSIDE LEVER RETRACTS BOTH DEADBOLT AND LATCH BOLT SIMULTANEOUSLY. AUXILIARY LATCH DEADLOCKS LATCHBOLT WHEN DOOR IS LOCKED. INSIDE LEVER IS ALWAYS FREE FOR

- LOCATION OF NEW SURFACE MOUNTED ELECTRICAL PANELS AND EQUIPMENT, (FUTURE LOCATION OF SOLAR POWER INVERTER AND EQUIPMENT) REFER TO ELECTRICAL PLANS AND SPECIFICATIONS (COORDINATE LOCATIONS IN STORAGE ROOM AND AT EXISTING TRANSFORMER FENCED IN AREA)
- NEW WALL MTD. ELECTRIC HAND DRYER, IN "ADA" RECESSED (CONTRACTOR TO SAW CUT AND FIT IN NEW RECESSED NITCH) (BASED ON XLERATOR HADE DRYER MODEL #XL-SB BRUSHED STAINLESS STEEL) REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR POWER
- INSTALL NEW FLOOR DRAIN SYSTEM IN EXISTING CONCRETE FLOOR SLAB. PATCH AND REPAIR CONCRETE AS REQUIRED, EXISTING CONCRETE FLOOR AND NEW RESINOUS FINISH SURFACE TO BE SLOPED FOR DRAINAGE TO FLOOR DRAIN. (PROVIDE FLUSH SURFACE MOUNTED FLOOR DRAIN SYSTEM COORDINATE WITH RESINOUS FLOOR FINISH) REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS, REFER TO DETAILS, TYPICAL AT ALL LOCATIONS.
- EXISTING CONCRETE FLOOR AND NEW RESINOUS FINISH SURFACE TO BE SLOPED FOR DRAINAGE TO FLOOR DRAIN, (PROVIDE FLUSH SURFACE MOUNTED FLOOR DRAIN SYSTEM COORDINATE WITH RESINOUS FLOOR FINISH) REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS, REFER TO DETAILS, TYPICAL AT ALL
- NEW 8" INTERIOR PARTITION REINFORCED CMU WALL ON NEW 8" REINFORCED THICKEN SLAB CONSTRUCTION, EPOXY PAINTED BOTH SIDES, REFER TO SECTION
- NEW 8" "SINGLE SCORE" EXTERIOR FACE CMU WALL TO BE "TOOTHED-IN" TO EXISTING WALL CONSTRUCTION TO MATCH, PROVIDE BULL-NOSE EDGES AND CORNERS AT EXPOSED DOOR JAMB (PROVIDE OWNER APPROVED CMU COLOR MATCH BY OWNER) PROVIDE EXTERIOR PAINTING TO MATCH EXISTING AND INTERIOR EPOXY PAINT, REFER TO SECTION DETAILS
- GFCI ELECTRICAL OUTLET AT 42" A.F.F., REFER TO ELECTRICAL DRAWINGS

- SAND, PRIME AND PAINT EXISTING HOLLOW METAL DOOR AND FRAME SYSTEM INTERIOR AND EXTERIOR (COLOR SELECTED BY OWNER) CONTRACTOR TO REMOVE AND RE-INSTALL ALL DOOR HARDWARE BEFORE AND AFTER PAINTING (INCLUDING WALL STOP) TYPICAL AT ALL LOCATIONS
- PATCH AND REPAIR ALL CMU WALL SURFACES / LOCATIONS (FROM REMOVED FIXTURES, HARDWARE AND EQUIPMENT ETC.) PROVIDE NEW PRIMED AND EPOXY PAINTED, FINAL COLOR SELECTION BY OWNER, TYPICAL AT ALL LOCATIONS
- NEW PLUMBING FIXTURES, TYPICAL AT ALL LOCATIONS, REFER TO MECHANICAL PLANS
- MODIFY EXISTING PIPE CHASE PLUMBING CONNECTIONS AS REQUIRED FOR NEW TOILET ROOM DIMENSIONS AND ADA BARRIER FREE REQUIREMENTS, TYPICAL AT ALL LOCATIONS, REFER TO MECHANICAL PLANS
- CONTRACTOR TO PROVIDE NEW INTERNATIONAL ADA ACCESSIBLE DETAILED AND MOUNTED HEIGHT ROOM SIGNAGE AT EACH OF THE EXISTING AND NEW ROOMS, CONTRACTOR TO COORDINATE WITH OWNER ON GRAPHICS AND COLOR SELECTION, REFER TO DETAILS
- NEW CONTINUOUS HINGED SOLID, OVER HEAD BRACED, FLOOR MOUNTED PLASTIC TOILET PARTITION AND DOOR PARTITION SYSTEM, FINAL COLOR SELECTION BY OWNER, TYPICAL AT ALL LOCATIONS. PARTITIONS BASED ON SANTANA, COMTEC OR CAPITAL HDPE, FIRE RATED 100% POST CONSUMER RECYCLED CONTENT

6'-0"

OWNER PROVIDED AND CONTRACTOR INSTALLED "NARCAN" SAFETY BOX, TO BE WAL MOUNTED AT ADA APPROVED HEIGHT AND LOCATION, COORDINATE IN FIELD WITH OWNER

14" WIDE x 14" TALL RECTANGLE SHAPE PRE-FINISHED ALUMINUM ARCHITECTURAL LOUVER SYSTEM WITH INSECT SCREEN BY "ARCHITECTURAL LOUVER CO.,

HARRAY LLC MODEL # E2JS

NEW "ADA" TOILET LOCATION TO BE 18" CENTER LINE FROM EDGE OF EXISTING WALL, CONTRACTOR TO FIELD VERIFY, CONTRACTOR TO SAW CUT CONCRETE FLOOR AND ADJUST TOILET AND SANITARY LINE LOCATION AS REQUIRED TO MEET ACCESSIBILITY CODE, TYPICAL AT ALL LOCATIONS

LOCATION OF EMERGENCY PHONE SYSTEM, CONTRACTOR TO COORDINATE IN FIELD WITH OWNER AND I.T. DEPARTMENT AS REQUIRED

- COORDINATE REMOVAL AND REPLACEMENT OF EXISTING EXTERIOR PAVING AND INSTALLATION OF NEW ELECTRICAL SERVICE FEEDERS AND CONDUITS WITH ELECTRICAL AND CIVIL DRAWINGS AND SPECIFICATIONS AS REQUIRED
- PATCH AND REPAIR CONCRETE FLOOR AS REQUIRED WITH NEW TO MATCH EXISTING. TYPICAL AT ALL LOCATIONS
- PATCH AND REPAIR CMU WALLS AS REQUIRED WITH NEW TO MATCH EXISTING, TYPICAL AT ALL LOCATIONS
- NEW HOLLOW METAL DOOR AND FRAME SYSTEM WITH STORAGE ROOM LOCK (KEY TO OWNERS MASTER KEYING) CUT INTO EXISTING CMU WALL, CONTRACTRO TO PROVIDE DOUBLE 4" x 4" x 1/4" BACK TO BACK GALVANIZED STEEL ANGLE LINTEL FOR NEW DOOR OPENING.

PROVIDE 1 EA. CONTINUES HINGES #780 112HD BY HAGER WITH ALUM FINISH, 1 EA. MORTISE LOCKESET #3896 SECT. ARC BY HAGER WITH US26 FINISH AND SMALL FORMATTED INTERCHANGEABLE CORE (SFIC) WITH 1 EA THRESHOLD 425 BY NGP WITH ALUM FINISH WITH 1 EA. SWEEP #675A BY NGP. KEYING TO MATCH OWNERS EXISTING SYSTEM, PROVIDE ALLEGION #4CY PROVIDE ALLEGION F15 STORE ROOM LOCK WITH

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ENGINEER:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S **BIDS & PERMITS** CONSTRUCTION

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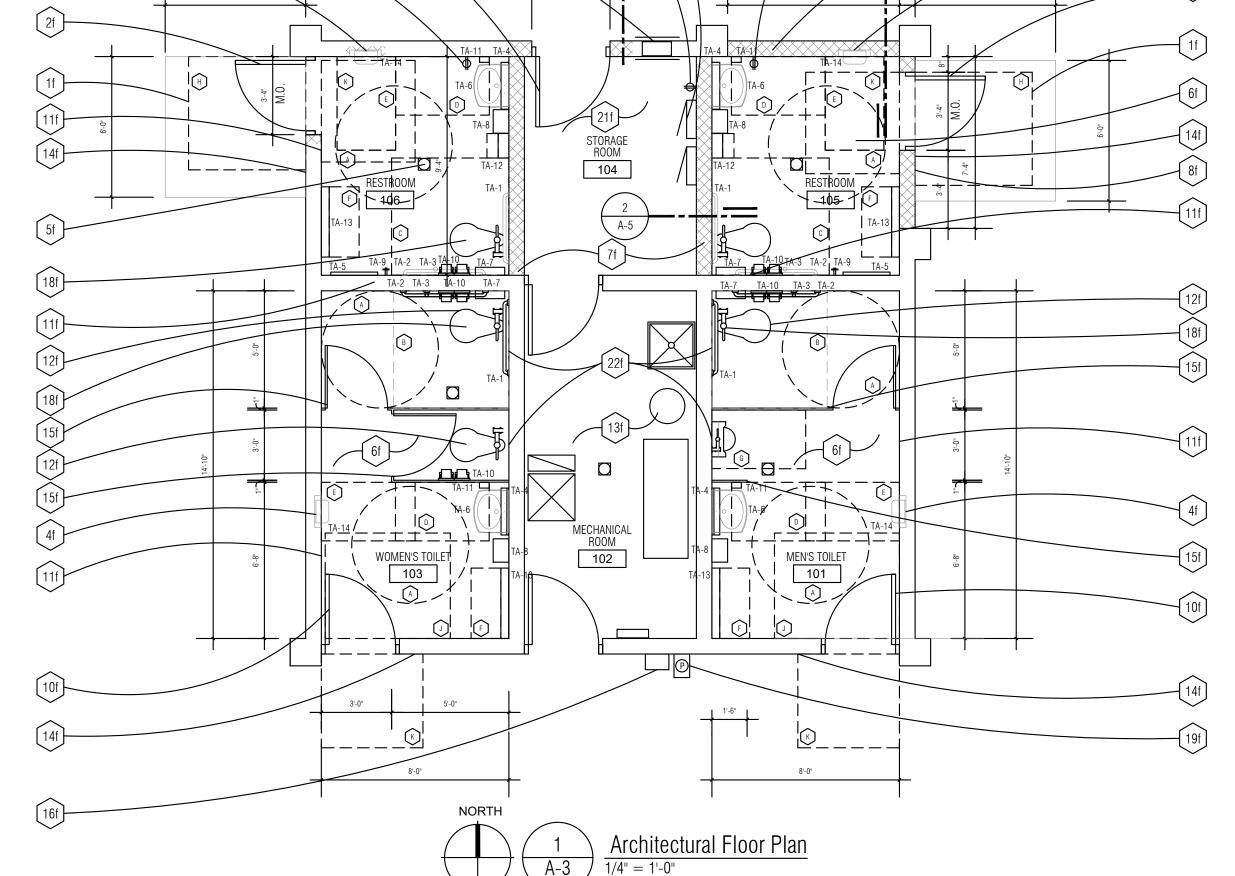
REVISIONS: SCHEMATIC DESIGN **DESIGN DEVELOPMENT** OWNER REVIEW FINAL REVIEW **OWNER REVIEW** 01/19/24 EGAL REVIEW PERMITS & BIDS

19 SEPT. 2023

PROJECT NO.:

Restroom Floor Plan

and RCP



NOTE: ALL DIMENSIONS ARE APPROXIMATE +/- DIMENSIONS.

CONTRACTORS WILL BE RESPONSIBLE TO FIELD VERIFY ALL DIMENSIONS AND LOCATIONS.

TA-10 WALL MTD. DOUBLE TOILET TISSUE DISPENSER (BOBRICK #B-6867 OR EQUAL)

GENERAL NOTES:

- 1. ALL PLAN DIMENSIONS ARE NOMINAL TO FACE OF WALL. WALL THICKNESS ARE SHOWN NOMINAL SEE WALL TYPES FOR ACTUAL THICKNESS.
- 2. COORDINATE SIZE AND LOCATION OF ALL DUCT AND SHAFT OPENINGS IN WALLS, CEILINGS AND FLOORS WITH MECHANICAL AND ELECTRICAL. PROVIDE ALL REQUIRED LINTELS FOR OPENINGS.
- 3. DO NOT SCALE DRAWINGS. USE DIMENSIONS PROVIDED. IF A CONFLICT IS ENCOUNTERED OR A REQUIRED DIMENSION IS NOT PROVIDED, REQUEST A CLARIFICATION FROM THE ARCHITECT.
- 4. ALL WORK SHALL COMPLY WITH NATIONAL, STATE AND LOCAL CODES, ORDINANCES AND REGULATIONS.
- 5. CONTRACTOR SHALL BE HELD RESPONSIBLE FOR VISITING THE JOB SITE AND FAMILIARIZING THEMSELVES WITH EXISTING CONDITIONS PRIOR TO START OF WORK. ALL DIMENSIONS AND FIELD CONDITIONS SHALL BE VERIFIED, AND ARCHITECT NOTIFIED OF ANY DISCREPANCIES PRIOR TO THE RECEIPT OF BIDS. FAILURE OF THE CONTRACTOR TO VERIFY ALL CONDITIONS PRIOR TO THE AWARD OF BID WILL NOT BE CONSIDERED AS GROUNDS FOR AN EXTRA.
- 6. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE PERFORMANCE OF THE CONTRACT. PROVIDE ALL NECESSARY TEMPORARY PROTECTION TO ENSURE THE SAFETY OF THE WORKERS AND GENERAL PUBLIC DURING CONSTRUCTION.
- 7. ALL ITEMS SHALL BE AS SPECIFIED BY ARCHITECT AND ENGINEER AND AS APPROVED BY THE OWNER.
- 8. SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES TO THE ARCHITECT AND OWNER FOR REVIEW PRIOR TO INSTALLATION/APPLICATION.
- 9. ALL DEBRIS SHALL BE LEGALLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR.
- 10. ALL PRECAUTIONS SHALL BE TAKEN TO AVOID DAMAGE TO EXISTING MATERIALS AND CONSTRUCTION TO REMAIN.
- 11. CONTRACTOR SHALL KEEP NOISE, DUST, ETC., TO A MINIMUM STANDARD AS SET FORTH BY THE OWNER.
- 12. CONTRACTOR SHALL COORDINATE INSTALLATION AND PHASING OF WORK WITH THE OWNER'S REPRESENTATIVE PRIOR TO THE START OF WORK.
- 13. NOTE ALL DIMENSIONS ARE + / AND ARE TO BE FIELD VERIFIED
- 14. CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL NEW WORK AS REQUIRED FOR ELECTRICAL AND MECHANICAL WITH ARCHITECTURAL IF A CONFLICT IS ENCOUNTERED, REQUEST CLARIFICATIONS FROM THE ARCHITECT. REFER TO ELECTRICAL PLANS FOR LIGHT FIXTURE TYPES, LOCATIONS AND SPECIFICATIONS. REFER TO MECHANICAL PLANS FOR DIFFUSER, REGISTERS AND RETURN GRILLES TYPES, LOCATIONS AND SPECIFICATIONS. REFER TO STRUCTURAL FOR NEW SYSTEMS DETAILS AND SPECIFICATIONS.
- 15. CONTRACTOR SHALL CUT AND PREP AND PATCH ALL EXISTING WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO COMPLETE THE WORK.

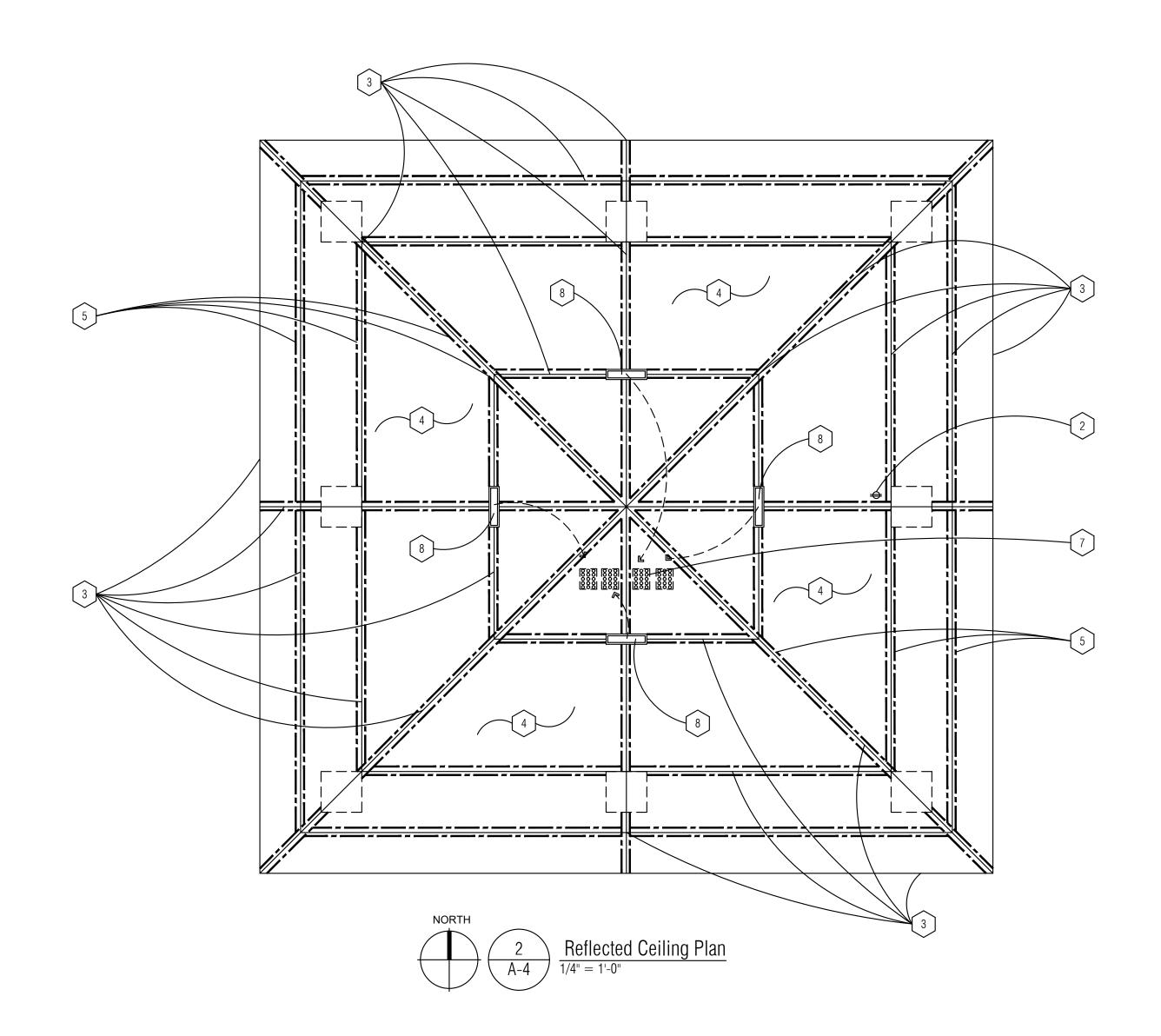
FLOOR PLAN KEY NOTES:

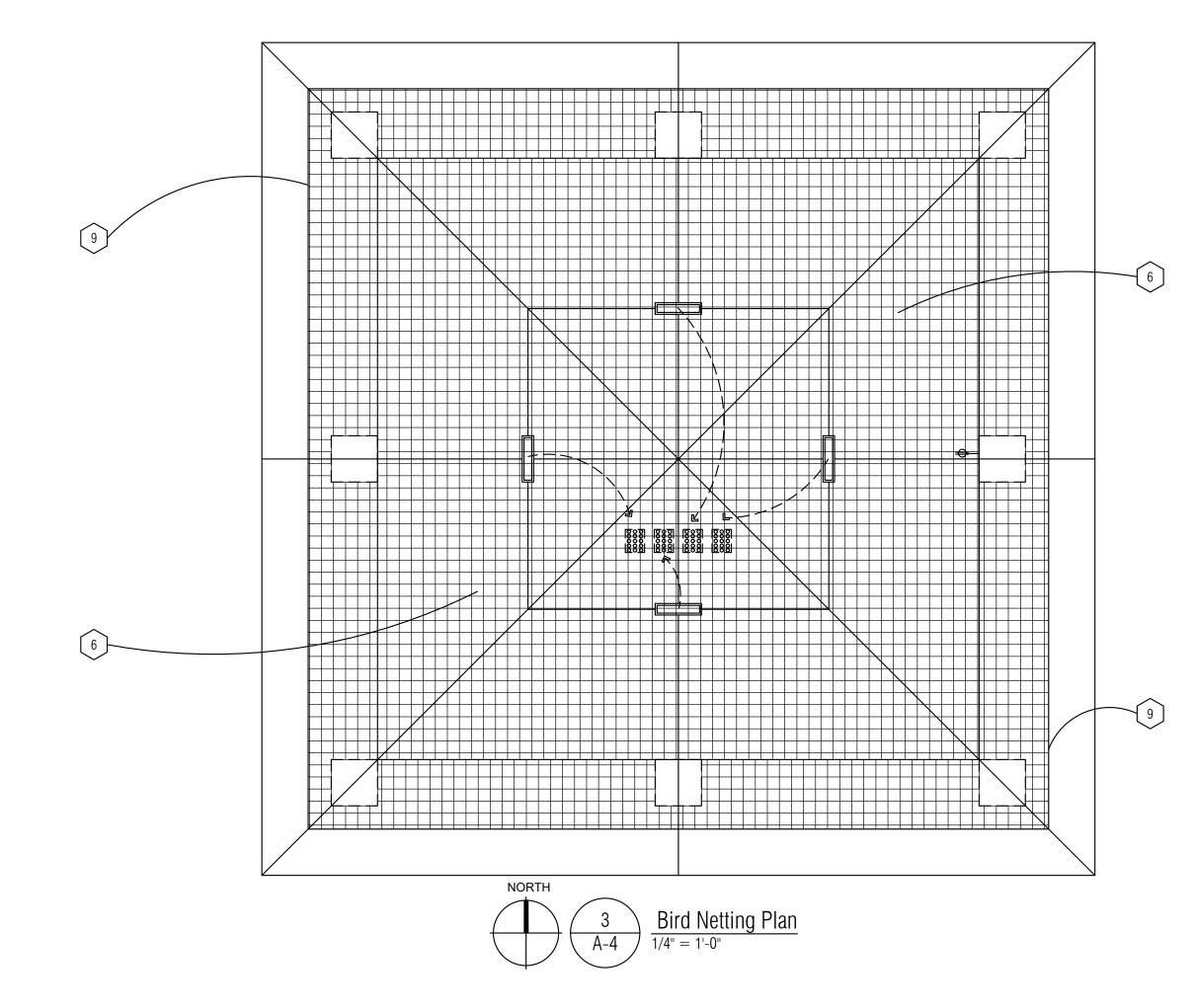
- REMOVE AND REPLACE EXISTING POWER OUTLET WITH NEW EXTERIOR GFCI WEATHER PROOF ELECTRICAL OUTLET, PROVIDE NEW OUTLET WITH WEATHER PROOF COVER
- REMOVE AND RELOCATE EXISTING "HIGH" CEILING POWER OUTLET WITH NEW "TOP OF COLUMN" EXTERIOR GFCI WEATHER PROOF ELECTRICAL OUTLET, PROVIDE NEW OUTLET WITH WEATHER PROOF COVER
- SCRAP, WIRE BRUSH, PRIME AND RE-PAINT ALL EXPOSED EXISTING HORIZONTAL AND SLOPED STEEL BEAMS, ANGLES, COLUMNS, PLATES, BRACKETS, BOLTS ALONG ALL EXPOSED SURFACES AND EDGES, TYPICAL AT ALL LOCATIONS

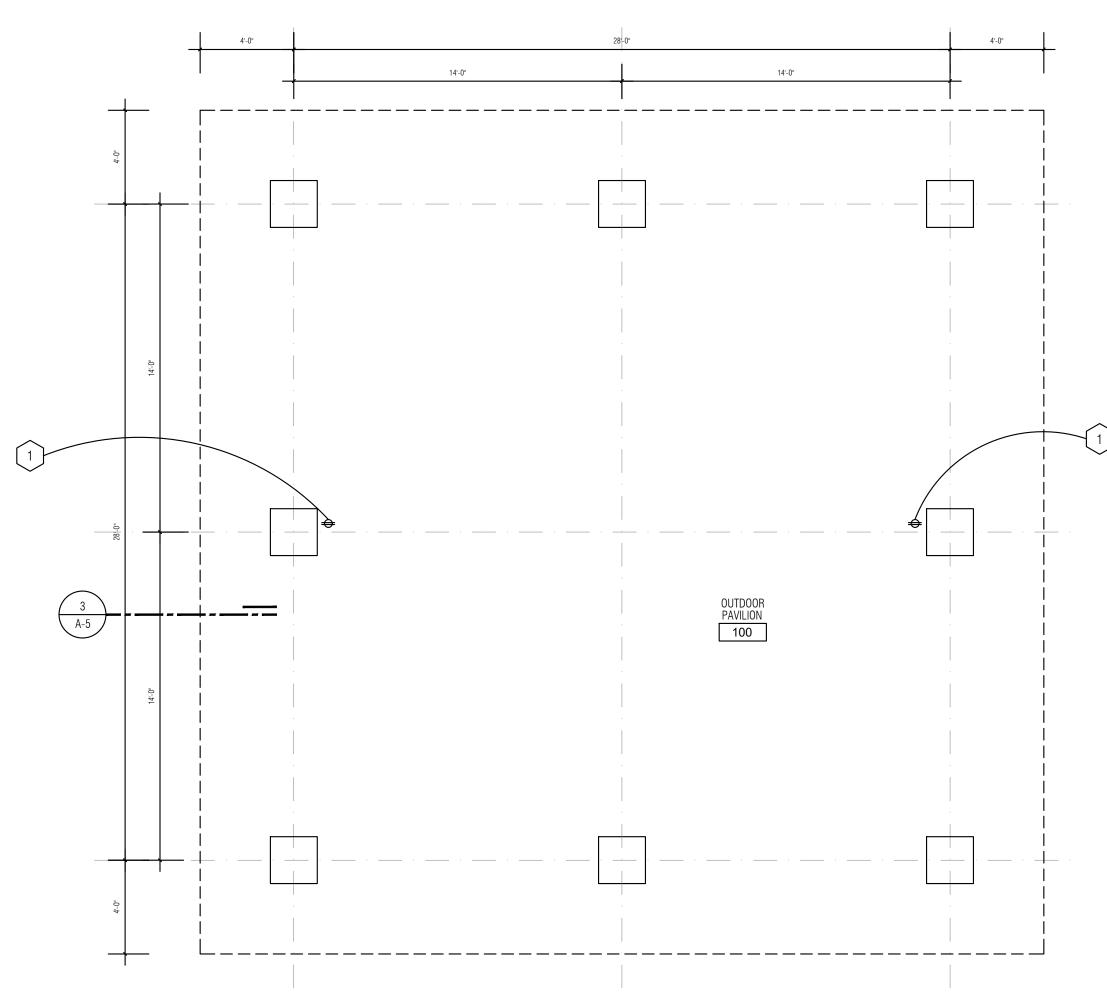
PRIMER: PER MANUFACTURES RECOMMENDATIONS WITH SHERWIN-WILLIAMS KEM KROMK UNIVERSAL METAL PRIMER

- PAINT: 2 COATS PER MANUFACTURES RECOMMENDATIONS WITH SHERWIN -WILLIAMS PRO-INDUSTRIAL ALKYD ENAMEL
- SAND, POWER WASH AND CLEAN ALL EXPOSED EXISTING TONGUE AND GROOVE HORIZONTAL AND SLOPED WOOD DECKING AND TRIM

 STAIN: 2 COATS PER MANUFACTURES RECOMMENDATION WITH SHERWIN-WILLIAMS SEMI-TRANSPARENT WATERBORNE SUPER DECK STAIN
- PROVIDE BIRD SPIKE SYSTEM BY "NIXALITE" ON TOP EDGE OF STEEL BEAM FLANGES AND SIDE WALL OF STEEL BEAM WEBS, TYPICAL AT ALL LOCATIONS FOR ALL EXPOSED STEEL BEAMS, REFER TO DETAILS, PROVIDE MANUFACTURE ANCHORS AND ADHESIVE TO EXISTING
- PROVIDE BIRD NETTING SYSTEM BY "NIXALITE" HORIZONTALLY UNDER PAVILION STRUCTURE AT APPROXIMATELY 8'-6" A.F.F. STARTING FROM OUTSIDE EDGE OF ANGLED STEEL BEAM CONTINUOUSLY TO OUTSIDE EDGE, REFER TO DETAILS
- ALONG SOUTH FACING ROOF SLOPE PROVIDE ROOF MOUNTED SOLAR PHOTOVOLTACIS PANEL FOR LIGHT FIXTURES, PROVIDE PANEL MOUNTING AND THRU ROOF PENETRATION (PROVIDE ONLY 1 PENETRATION FOR ALL 4 PANELS) PROVIDE NEW FLASHING PENETRATION BOOT AND ROOFING SEALANT AS REQUIRED TO MAINTAIN WATER TIGHTNESS OF EXISTING ROOFING SYSTEM
- 8 CEILING MOUNTED ON UNDERSIDE OF EXISTING STEEL STRUCTURE NEW "LED" SOLAR POWER LIGHT FIXTURES
 - 18 WATT LED POWER
 80 WATT SOLAR PANEL #SP-80W
 BY SOLAR PATH SUN SOLUTIONS OUTDOOR LIGHTING
 # SP-XL-A-80W-18W-3-40K-288WH-WH-01
 288WH LITHIUM BATTERY PACK
 SOLAR CHARGING CONTROLLER #SR-MPC2415/SR-MPC2410
 MOTION SENSOR
 DUSK TO DAWN PHOTO EYE OPERATION
 REMOTE CONTROL TIMER #SR-CU-D
 STANDARD 5 METER CABLE PLUS EXTENDED LENGTH
- PROVIDE BY "NIXALITE" ALL REQUIRED CONNECTIONS, ANCHORS, TURN BUCKLES, HOOKS AND HORIZONTAL SUPPORT CABLE SYSTEM FOR "BIRD NETTING SYSTEM" TO BE GALVANIZED STEEL WIRE ROPE, LOCATED AT PERIMETER AND GRID LAYOUT, (DESIGN-BUILD PER MANUFACTURE), TYPICAL AT ALL LOCATIONS FOR SELF SUPPORTED INDEPENDENT SYSTEM INSTALLATION







Architectural Floor Plan

DIMENSIONS AND LOCATIONS.

NOTE: ALL DIMENSIONS ARE APPROXIMATE +/- DIMENSIONS. CONTRACTORS WILL BE RESPONSIBLE TO FIELD VERIFY ALL



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ESTROOMS and PAVIL

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DESIGN DEVELOPMENT

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CONSTRUCTION

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 11/07/23

 DESIGN DEVELOPMENT
 11/16/23

 OWNER REVIEW
 11/20/23

 FINAL REVIEW
 12/08/23

 OWNER REVIEW
 01/19/24

 EGAL REVIEW
 02/12/24

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 03/14/24

DATE: 19 SEPT. 2023

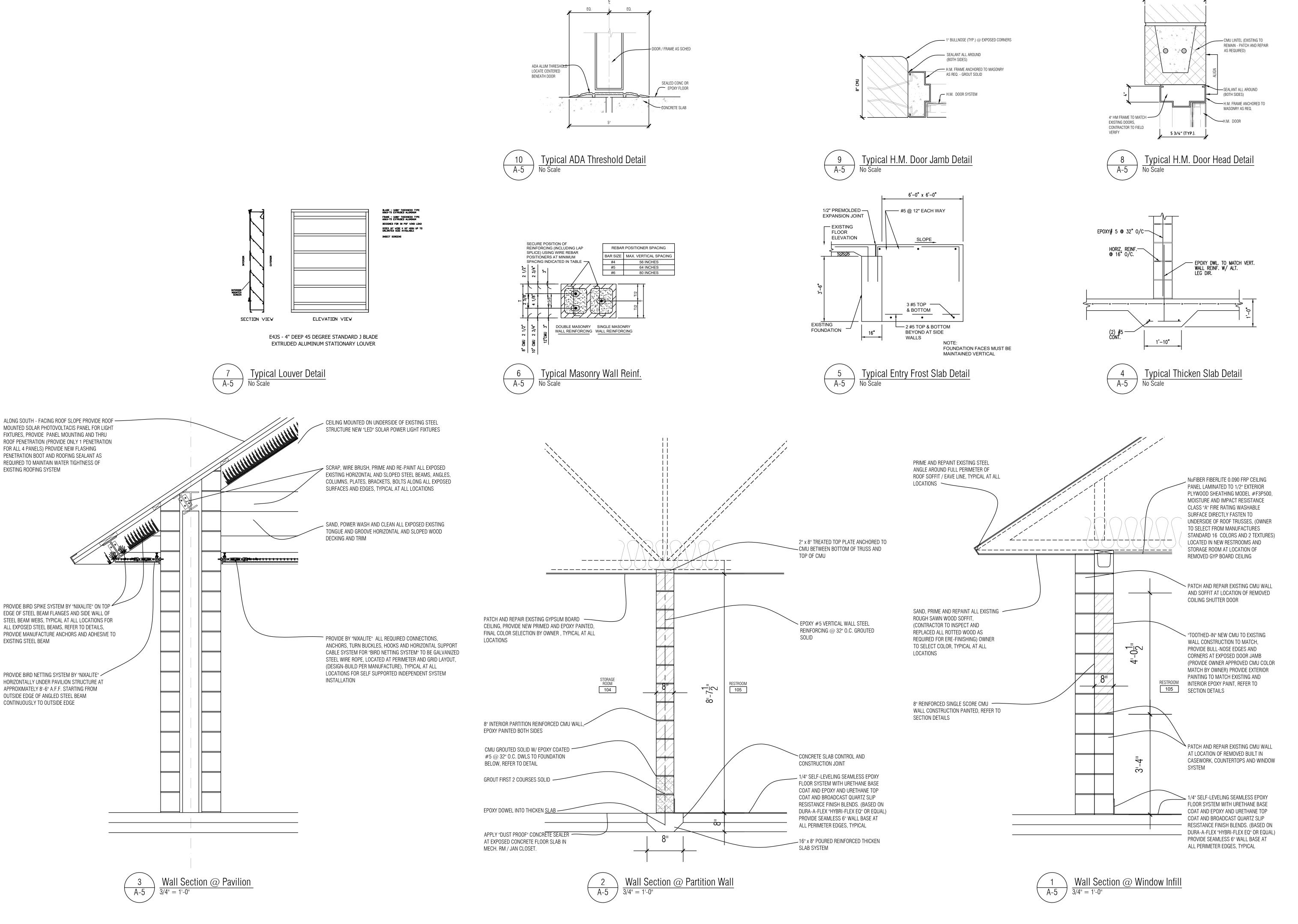
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Pavilion Floor Plan and RCP

SHEET NO.:





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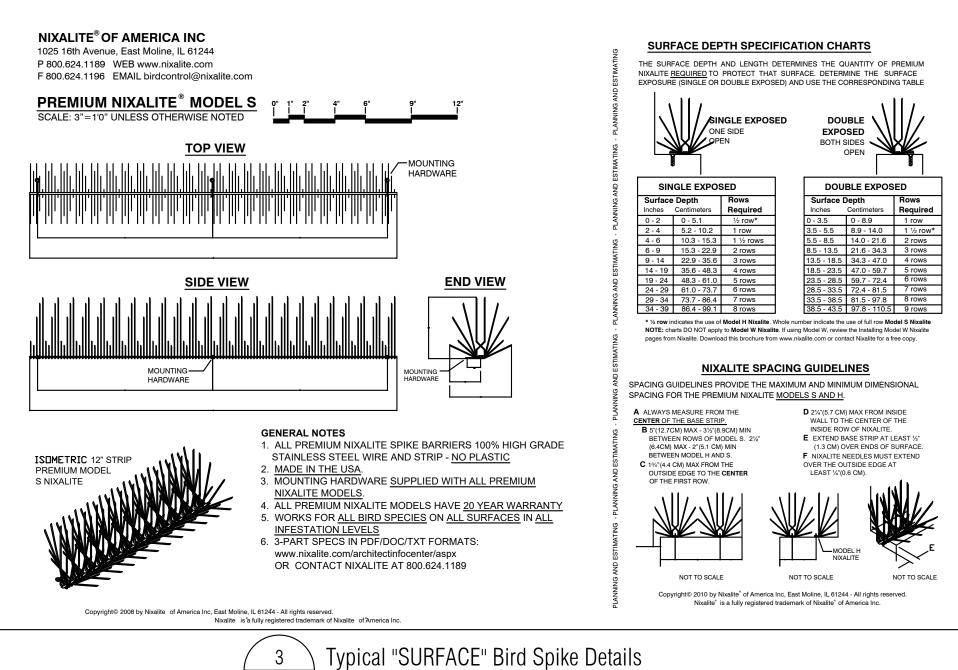
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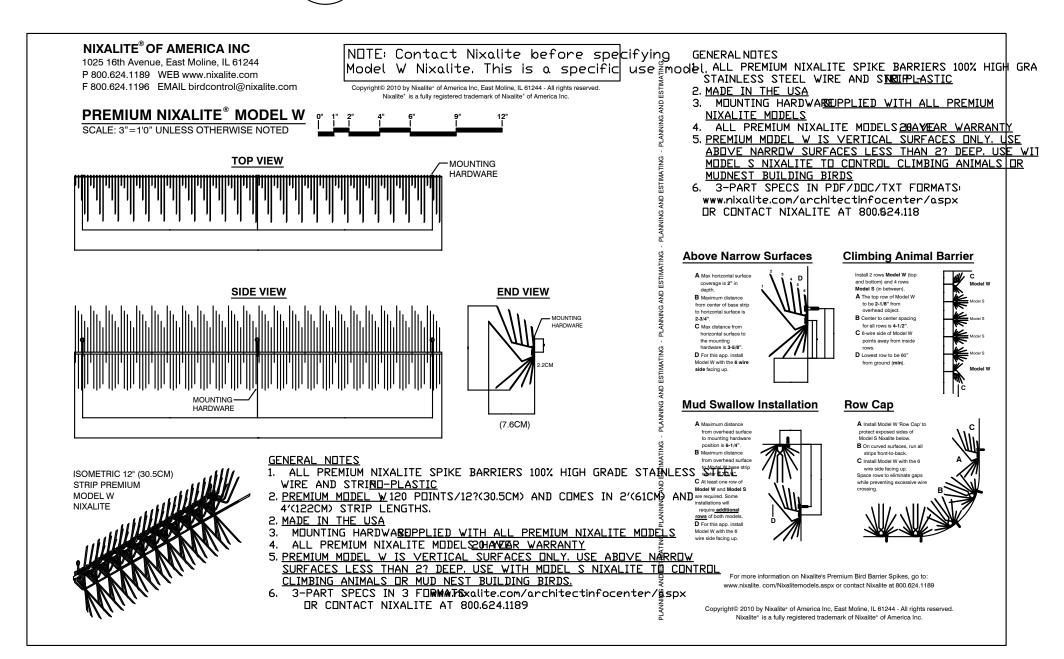
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Sections and Details

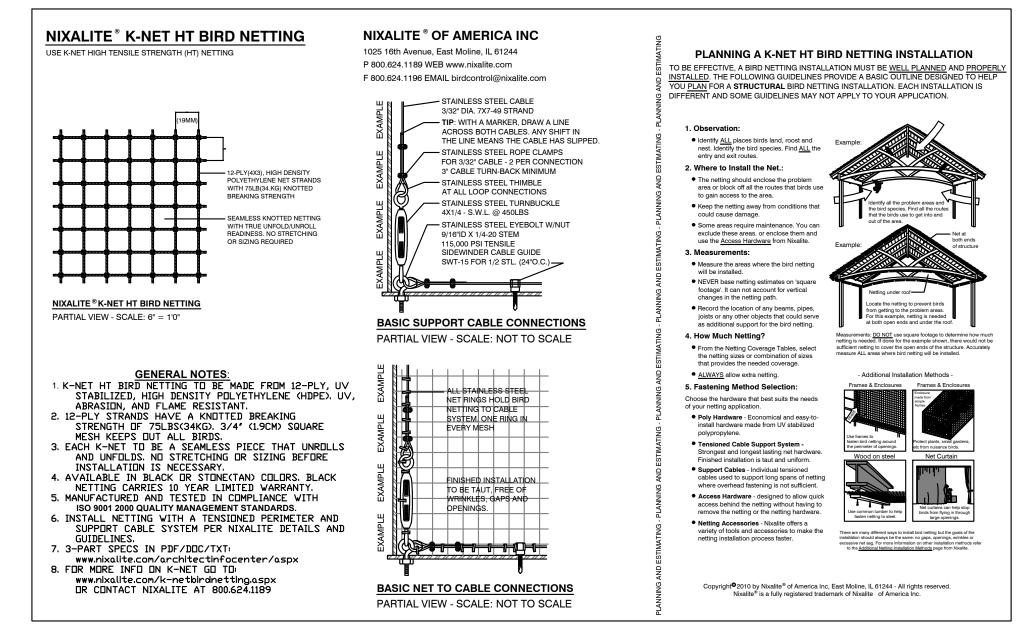
SHEET NO.:

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ROOM NO.	ROOM NAME	FLOOR	BASE	NORTI	H WALL	EAST	WALL	SOUT	H WALL	WEST	WALL	CEI	LING	REMAR
TIOOWI NO.		TEOUT	DAGE	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	MAT	FIN	
101	MEN'S TOILET	UR	UR	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	FRP	PRE	1, 2
102	MECHANICAL ROOM	S. CONC	EX-PATCH	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	WD	ETR	1
103	WOMEN'S TOILET	UR	UR	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	CMU	EXP PNT	FRP	PRE	1, 2
104	STORAGE ROOM	S. CONC	EX-PATCH	CMU	EXP ETR	CMU	EXP ETR	CMU	EXP ETR	CMU	EXP ETR	WD	EXP PNT	1, 4
105	RESTROOM	UR	UR	CMU	EXP ETR	CMU	EXP ETR	CMU	EXP ETR	CMU	EXP ETR	WD	EXP PNT	1, 2, 4

Room Finish Schedule - Remarks

- 1. PATCH AND REPAIR EXISTING WALL AND CEILING SYSTEM AS REQUIRED FOR NEW INTERIOR DEMOLITION AND CONSTRUCTION
- PROVIDE SLIP RESISTANCE URETAHNE FLOOR SYSTEM WITH WALL BASE, SLOPE TO FLOOR DRAIN, COORDINATE NEW AND EXISTING ADA DOOR THRESHOLDS WITH NEW FLOORING SYSTEM AS
- 3. FILL HOLES, PRIME AND EPOXY PAINT GYPSUM WALL (PAINT COLORS TOP BE SELECTED BY OWNER
- 4. PATCH AND REPAIR PLYWOOD CEILING PANELS AND TRIM AS REQUIRED FOR NEW PRIME AND PAINTING OF FINISHES

Room Finish Schedule - General Notes

- A. SEE FLOOR PLANS, REFLECTED CEILING PLANS, SECTION DETAILS AND INTERIOR ELEVATIONS FOR ADD'L INFO.
- B. CONTRACTOR WILL BE RESPONSIBLE TO PROTECT EXISTING FLOOR, WALL AND CEILING FINISHES DURING CONSTRUCTION. CONTRACTOR WILL BE REQUIRED TO CLEAN ALL FINISHES AT COMPLETION OF NEW WORK. ANY DAMAGED FINISHES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AND REPLACE TO MATCH EXISTING.
- C. CONTRACTOR REQUIRED TO COORDINATE WITH MECHANICAL AND ELECTRICAL AND DIRTT PLANS FOR ALL ITEMS AS SPECIFIED, TYPICAL FOR ALL ROOM FINISHES AND LOCATIONS.

Door Schedule & Room Finish Legend

	n deneadle & not	JIII I III	non Logona		
ABBR.	DESCRIPTION	ABBR.	DESCRIPTION	ABBR.	DESCRIPTION
FRP	FIBER REINF PANEL	VCT VINYL COMPOSITION TILE		RUB	RUBBER BASE
PNT	PAINT	WD	WOOD	TREZZ	CONCRETE TREZZAO
ETR	EXISTING TO REMAIN	AL	ALUMINUM STOREFRONT	DIRTT	ARCHITECTURAL MANUFACTURE PARTITION
EXP PNT	EPOXY PRIME AND PAINTED	PRE	PREFINISHED	CMU	CONCRETE MASONRY UNIT
BR	BRICK MASONRY VENEER	СТ	CERMANIC / PORCEALN TILE	GYP	GYPSUM
UR	URETHANE RESIN ON CONCRETE	S. CONC	SEAL COATED CONCRETE	STL	STEEL PLATE

A R C H I T E C T S

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ENGINEER:

PROJECT NAME:

SCHEMATIC DESIGN DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S BIDS & PERMITS

CONSTRUCTION DRAWN BY:

REVISIONS:

CHECKED BY:

SCHEMATIC DESIGN	11/07/23
DESIGN DEVELOPMENT	11/16/23
OWNER REVIEW	11/20/23
FINAL REVIEW	12/08/23
OWNER REVIEW	01/19/24
EGAL REVIEW	02/12/24
PERMITS & BIDS	03/14/24

19 SEPT. 2023

23-037

PROJECT NO.:

DRAWING NAME:

Schedules and

Misc. Details

MECHANICAL ABBREVIATION LIST

MECHAI	NICAL ABBREVIATION LIST				
<u>ABBREVIATION</u>	<u>DESCRIPTION</u>	ABBREVIATION	DESCRIPTION	ABBREVIATION	<u>DESCRIPTION</u>
Α	COMPRESSED AIR	FD	FLOOR DRAIN	0	OXYGEN
A(*) AV	COMPRESSED AIR (SPECIFIC PSIG) AUTOMATIC AIR VENT	FFD FH	FUNNEL FLOOR DRAIN FIRE HYDRANT	OA OAT	OUTSIDE AIR OUTSIDE AIR TEMPERATURE
ACC	AIR COOLED CONDENSER	FHC	FIRE HOSE CABINET	OAG	OUTSIDE AIR TEMPERATURE OUTSIDE AIR GRILLE
ACCU	AIR COOLED CONDENSING UNIT	FHR	FIRE HOSE RACK	OBD	OPPOSED BLADE DAMPER
AD	ACCESS DOOR	FHV	FIRE HOSE VALVE	00	ON CENTER/CENTER TO CENTER
AD AE	AREA DRAIN AIR EXTRACTOR	FLA FLR	FULL LOAD AMPS FLOOR	OD OL	OUTSIDE DIAMETER OVERLOAD
AFF	ABOVE FINISHED FLOOR	FM	FLOW MEASURING DEVICE	ORC	OVERFLOW ROOF CONDUCTOR
AHU	AIR HANDLING UNIT	FMS	FLOW MEASURING STATION	ORD	OVERFLOW ROOF DRAIN
ALT AMP	ALTERNATE AMPERE	FPM FP	FEET PER MINUTE FIRE PUMP	OS&Y OV	OUTSIDE SCREW AND YOLK OUTLET VELOCITY
APD	AIR PRESSURE DROP	FPTU	FAN POWERED (AIR) TERMINAL UNIT		OOTEET VEEOOTT
AR	ARGON	FS	FLOOR SINK	PACU	PACKAGED AIR CONDITIONING UNIT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS	FT FTR	FEET FINNED TUBE RADIATION	PBD PC	PARALLEL BLADE DAMPER PUMPED CONDENSATE
ASR	AUTOMATIC SPRINKLER RISER	FV	FACE VELOCITY	PCW	PROCESS COOLING WATER
AUX AV	AUXILIARY ACID VENT	G	NATURAL GAS	PCWR	PROCESS COOLING WATER RETURN
AVTR	ACID VENT THROUGH ROOF	G GA	NATURAL GAS GAUGE	PCWS PD	PROCESS COOLING WATER SUPPLY PRESSURE DROP (FEET OF WATER)
AW	ACID WASTE	GAL	GALLON	PH	PERIMETER HEAT
BAS	BUILDING AUTOMATION SYSTEM	GRH GPH	GRAVITY RELIEF HOOD GALLONS PER HOUR	PHR PHS	PERIMETER HEAT RETURN PERIMETER HEAT SUPPLY
BCU	BLOWER COIL UNIT	GPM	GALLONS PER MOUR GALLONS PER MINUTE	PHS PNL	PANEL
BFP	BACKFLOW PREVENTER			PPM	PARTS PER MILLION
BHP	BRAKE HORSEPOWER BOTTOM OF DUCT	H HB	HYDROGEN HOSE BIBB	PRESS PRV	PRESSURE
BOD BOP	BOTTOM OF DUCT BOTTOM OF PIPE	HC HC	HEATING COIL	PRV PSI	PRESSURE REDUCING VALVE POUNDS PER SQUARE INCH
BTU	BRITISH THERMAL UNIT	HD	HOT DECK	PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
BTUH	BRITISH THERMAL UNIT PER HOUR	HEPA	HIGH EFFICIENCY PARTICULATE ARRESTANCE	PSIG	POUNDS PER SQUARE INCH - GAUGE
BWV	BACKWATER VALVE	HL HOA	HIGH LIMIT HAND/OFF/AUTO	PW PWR	PURIFIED WATER PURIFIED WATER RETURN
С	COMMON	HP	HEAT PUMP	PWS	PURIFIED WATER SUPPLY
CAP	CAPACITY CONSTANT AIR VOLUME	HP HPCW	HORSEPOWER	(D)	DELOCATED
CAV CB	CATCH BASIN	HPHW	HIGH PRESSURE DOMESTIC COLD WATER HIGH PRESSURE DOMESTIC HOT WATER	(R) RR	RELOCATED RETURN GRILLE OR REGISTER
CC	COOLING COIL	HPHWR	HIGH PRESSURE DOMESTIC HOT WATER RETURN	RA	RETURN AIR
CD	COLD DECK	HPL UDI D	HEAT PUMP LOOP PETLIPN	RAT	RETURN AIR TEMPERATURE
CD CFH	CONDENSATE DRAIN CUBIC FEET PER HOUR	HPLR HPLS	HEAT PUMP LOOP RETURN HEAT PUMP LOOP SUPPLY	RC RCP	RAIN CONDUCTOR RADIANT CEILING PANEL
CFM	CUBIC FEET PER MINUTE	HR	HOUR	RD	ROOF DRAIN
CH	CHILLER	HTG	HEATING	REQD	REQUIRED
CHW CHWR	CHILLED WATER CHILLED WATER RETURN	HV HVAC	HEATING VENTILATING HEATING, VENTILATING, AIR CONDITIONING	RF RH	RETURN FAN RELATIVE HUMIDITY
CHWS	CHILLED WATER SUPPLY	HWH	HOT WATER HEATING	RL	REFRIGERANT LIQUID
CLG	COOLING	HWHR	HOT WATER HEATING RETURN	RLFA	RELIEF AIR
CNDS CNDS (#)	CONDENSATE CONDENSATE (SPECIFIC PSIG)	HWHS HW	HOT WATER HEATING SUPPLY DOMESTIC HOT WATER	RPM RS	REVOLUTIONS PER MINUTE REFRIGERANT SUCTION
CO	CLEAN OUT	HW()	DOMESTIC HOT WATER (SPECIFIC TEMP °F)	RTU	ROOFTOP UNIT
CO2	CARBON DIOXIDE	HWR	DOMESTIC HOT WATER RETURN	0.0	OURDLY AIR RIFFURER OF ORMAT
CONT CONTR	CONTINUATION OR CONTINUED CONTRACTOR	HX HZ	HEAT EXCHANGER HERTZ	SD SA	SUPPLY AIR DIFFUSER OR GRILLE SOUND ATTENUATOR
CONV	CONVECTOR	112	1161112	SA	SUPPLY AIR
COS	CENTRAL OPERATOR STATION	IAQ	INDOOR AIR QUALITY	SAN	SANITARY WASTE
CP CRU	CIRCULATING PUMP CONDENSATE RETURN UNIT	ID IE	INSIDE DIAMETER INVERT ELEVATION	SAT SECT	SUPPLY AIR TEMPERATURE SECTION
CSS	CLINICAL SERVICE SINK	IH	INTAKE HOOD	SF	SUPPLY FAN
CT	COOLING TOWER	IN ID	INCHES	SH	SHOWER
CUH CW	CABINET UNIT HEATER DOMESTIC COLD WATER	IR IW	INFRARED HEATER INDIRECT WASTE	SK SP	SINK STATIC PRESSURE
CWR	CONDENSER WATER RETURN		Member Wildie	SPEC	SPECIFICATION
CWS	CONDENSER WATER SUPPLY	JC	JANITOR'S CLOSET	SPKLR	SPRINKLER
D&T	DRIP AND TRAP	JP	JOCKEY PUMP	SQFT S/S	SQUARE FOOT/SQUARE FEET START/STOP
DA	DISCHARGE AIR	KW	KILOWATT	SS	SERVICE SINK
DAT	DISCHARGE AIR TEMPERATURE	KWH	KILOWATT-HOUR	ST	STORM
DB DDC	DRY BULB DIRECT DIGITAL CONTROL	LAT	LEAVING AIR TEMPERATURE	STD STK	STANDARD STACK
DEG	DEGREE	LAB	LABORATORY	STM	STEAM
DFU	DRAINAGE FIXTURE UNITS	LAV	LAVATORY	STM(*)	STEAM (SPECIFIC PSIG)
DIA DMPR	DIAMETER DAMPER	LBS LDB	POUNDS LEAVING DRY BULB	S/W SW	SUMMER/WINTER SWITCH
D/N	DAY/NIGHT	LL	LOW LIMIT	011	OMITOR
DN	DOWN BOWN DOUT NO.771 F	LPC	LOW PRESSURE CONDENSATE	T	TRANSFER GRILLE
DNZ DT	DOWNSPOUT NOZZLE DRAIN TILE	LPS LRA	LOW PRESSURE STEAM LOCKED ROTOR AMPS	TC TC	TEMPERATURE CONTROL TEMPERING COIL
DTC	DRAIN TILE CONNECTION	LTU	LAB (AIR) TERMINAL UNIT	TCP	TEMPERATURE CONTROL PANEL
DWH	DOMESTIC WATER HEATER	LWB	LEAVING WET BULB	TD	TRENCH DRAIN
DWG	DRAWING	LWT	LEAVING WATER TEMPERATURE	TEMP TEMP	TEMPERATURE TEMPORARY
Œ	EXISTING	MA	MIXED AIR	TH	TERMINAL HEATING
E EA	EXHAUST GRILLE OR REGISTER EACH	MAT MAU	MIXED AIR TEMPERATURE MAKE-UP AIR UNIT	THR THS	TERMINAL HEATING RETURN TERMINAL HEATING SUPPLY
EA	EXHAUST AIR	MV	MANUAL AIR VENT	TSP	TOTAL STATIC PRESSURE
EAT	ENTERING AIR TEMPERATURE	MAX	MAXIMUM	TU	(AIR) TERMINAL UNIT
EC ECUH	EXPANSION COMPENSATOR ELECTRIC CABINET UNIT HEATER	MBH MCA	THOUSAND BRITISH THERMAL UNITS PER HOUR MEDICAL COMPRESSED AIR	TV TYP	TURNING VANES TYPICAL
EDB	ENTERING DRY BULB	MCA	MINIMUM CIRCUIT AMPACITY		
EEW	EMERGENCY EYE WASH	MCC	MOTOR CONTROL CENTER	UH	UNIT HEATER
EF EFF	EXHAUST FAN EFFICIENCY	MECH MEZZ	MECHANICAL MEZZANINE	UL UON	UNDERWRITER'S LABORATORY UNLESS OTHERWISE NOTED
EHC	ELECTRIC HEATING COIL	MFR	MANUFACTURER	UR	URINAL
EJ	EXPANSION JOINT	MH	MANHOLE	UV	UNIT VENTILATOR
EL ELEC	ELEVATION ELECTRICAL	MIN MISC	MINIMUM MISCELLANEOUS	V	VALVE
EMS	ENERGY MANAGEMENT SYSTEM	MMBH	MILLION BRITISH THERMAL UNITS PER HOUR	V	VENT
ERL	ENERGY RECOVERY LOOP	M/S	MOTOR STARTER	VAC	VACUUM
ERLR ERLS	ENERGY RECOVERY LOOP RETURN ENERGY RECOVERY LOOP SUPPLY	MTD MTR	MOUNTED MOTOR	VAV VD	VARIABLE AIR VOLUME VOLUME DAMPER (MANUALLY ADJUSTABLE)
ERU	ENERGY RECOVERY UNIT	MVAC	MEDICAL VACUUM	VOL	VOLUME
ER	EXHAUST REGISTER	N.I.	NEW	VSD	VARIABLE SPEED DRIVE
ESP EUH	EXTERNAL STATIC PRESSURE ELECTRIC UNIT HEATER	N N2O	NEW NITROUS OXIDE	VTR VUV	VENT THROUGH ROOF VERTICAL UNIT VENTILATOR
EWB	ENTERING WET BULB	NC	NOISE CRITERIA		
EWC	ELECTRIC WATER COOLER	NC	NORMALLY CLOSED	W	WASTE AND VENT
EWT EXH	ENTERING WATER TEMPERATURE EXHAUST	NCTC NCTO	NORMALLY CLOSED TIMED CLOSED NORMALLY CLOSED TIMED OPEN	W&V WB	WASTE AND VENT WET BULB
_/N I		NFPA	NATIONAL FIRE PROTECTION AGENCY	WC	WATER CLOSET
F	FIRE PROTECTION	NOTC	NORMALLY OPEN TIMED CLOSED	WC	WATER COLUMN
°F F&B	DEGREES FAHRENHEIT FACE AND BYPASS	NOTO NIC	NORMALLY OPEN TIMED OPEN NOT IN CONTRACT	WG WH	WATER GAUGE WALL HYDRANT
F&T	FLOAT AND THERMOSTATIC	NO NO	NORMALLY OPEN	WPD	WATER PRESSURE DROP
FA	FACE AREA	NOM NDCW	NOMINAL	WT	WEIGHT
FCU	FAN COIL UNIT	NPCW	NON POTABLE COLD WATER	XFMR	TRANSFORMER

MECHANICAL SYMBOL LIST

——IVH—— VALVE - PLUG

VALVE - PRESSURE REGULATING

VENT THROUGH ROOF

WALL HYDRANT

→ VALVE - PRESSURE REDUCING

PIPING SYMBOLS		DUCTWORK SYM	BOLS	SHEET
<u>SYMBOL</u>	DESCRIPTION	<u>SYMBOL</u>	<u>DESCRIPTION</u>	M-O
——————————————————————————————————————	AIR VENT - AUTOMATIC		AIR TERMINAL UNIT	M-1 M-2
Mv 🗖	AIR VENT - MANUAL	<u> </u>	AIR TERMINAL UNIT WITH HEATING COIL	P-1
BFP BFP	BACKFLOW PREVENTER	, 4= ,		P-2
	CATCH BASIN	├──	AIR TERMINAL UNIT - LABORATORY	SPM-1
	CIRCULATING PUMP	├──		SPM-2
	CLEAN OUT - IN FLOOR CLEAN OUT - FLANGE		DAMPER - HORIZONTAL FIRE (EXISTING, NEW)	
	DIRECTION OF FLOW	_6 _•		
	DIRECTION OF PITCH - DOWN		DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)	
	FINNED TUBE RADIATION	_^ _ ^	DAMPER - SMOKE (EXISTING, NEW)	OT A NII
¢,	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING		DAMPER - VERTICAL FIRE (EXISTING, NEW)	STAN
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED	_& &		1
•	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED		DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)	3
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT	M	DAMPER - MOTORIZED	F
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL		DAMPER - VOLUME (MANUALLY ADJUSTABLE)	6
~~~~3⊙	FLOOR DRAIN	<u></u>		
\	FLOOR DRAIN - ELEVATION		DIFFUSER - BLANK OFF	1
——	FLOOR DRAIN - FUNNEL		DIFFUSER - LINEAR SLOT	
, . Y	FLOOR DRAIN - FUNNEL, ELEVATION		DIFFUSER - SQUARE OR RECTANGULAR	
$ \downarrow$ \downarrow \downarrow \vdash	FLOW MEASURING DEVICE			
	FLOW SWITCH		DUCT CROSS SECTION - SUPPLY	
MH HB	HOSE BIBB MANHOLE		DUCT CROSS SECTION - RETURN OR EXHAUST	
<u></u>	OPEN SITE DRAIN		DUCT - FLEXIBLE CONNECTION	(
	PIPE - ANCHOR	 }}}}}-	DUCT - FLEXIBLE DUCT	
 =	PIPE - CAP OR PLUG	(DUCT TAKE-OFF - ROUND CONICAL	
	PIPE - ELBOW DOWN PIPE - ELBOW UP	, J. ,	DUCT TAKE-OFF - NOUND CONICAL	
	PIPE - EXPANSION JOINT OR COMPENSATOR		DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP	
	PIPE - FLANGE	5	ELBOW - RECTANGULAR WITH TURNING VANES	
	PIPE - FLEXIBLE CONNECTION	5	ELBOW - RECTANGULAR/ ROUND SMOOTH RADIUS	
	PIPE - GUIDE			
	PIPE - TEE DOWN	├	ELBOW DOWN - RECTANGULAR	
	PIPE - TEE UP PIPE - UNION	\leftarrow	ELBOW DOWN - ROUND	
Φ <u>Τ</u> Ρ/Τ	PRESSURE AND TEMPERATURE TEST PLUG	<u> </u>	ELBOW UP - RECTANGULAR	
<u></u>	PRESSURE GAUGE AND COCK	\leftarrow	ELBOW UP - ROUND	•
$\overline{}$	REDUCER - CONCENTRIC	<u> </u>	FAN - AXIAL	
	REDUCER - ECCENTRIC		FAN - CENTRIFUGAL (ELEVATION)	
	ROOF DRAIN STEAM TRAP - FLOAT AND THERMOSTATIC	و٢	FAN - CENTRIPOGAL (ELEVATION)	
	STRAINER	├──	HEATING COIL	()
**************************************	STRAINER WITH BLOW-OFF	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	INCLINED DROP IN DIRECTION OF AIRFLOW	M5.1
	THERMOMETER	S R	INCLINED RISE IN DIRECTION OF AIRFLOW	
——>o ∡i	TRAP		INTAKE OR RELIEF HOOD	SHEE
—— 华 ——	VALVE - ANGLE	<u> </u>	REGISTER - RETURN OR EXHAUST	
——V——	VALVE - BALL VALVE - BALANCE		REGISTER - RETURN WITH BOOT	
	VALVE - BUTTERFLY	<u>/ </u>		
——————————————————————————————————————	VALVE - COMBINATION BALANCE & FLOW MEASURING		REGISTER - TRANSFER GRILLE	
	VALVE - CHECK	(□)	ROOF EXHAUST FAN	
──∮ %I──	VALVE - SPRING CHECK	├	TRANSITION - CONCENTRIC	<i></i>
——і√——	VALVE - GAS (MANUAL))		
	VALVE - GLOBE	├─	TRANSITION - ECCENTRIC	
——————————————————————————————————————	VALVE - ISOLATION VALVE - NEEDLE		UNIT HEATER - HORIZONTAL THROW	NOTE
——————————————————————————————————————			UNIT HEATER - VERTICAL THROW	NOTE∙ AL M
	VALVE - OS&Y	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\		

SHEET NO. SHEET TITLE

MECHANICAL COVER SHEET

MECHANICAL FLOOR PLANS MECHANICAL DETAILS AND SCHEDULES

PLUMBING FLOOR PLANS P-2 PLUMBING DETAILS AND SCHEDULES

MECHANICAL AND PLUMBING SPECIFICATIONS

SUPPLY DIFFUSER WITH SCHEDULE TAG "1", 10" DIAMETER NECK SIZE 350 CFM TYPICAL FOR 4

RG-1 22"x 22" NECK SIZE 22x22 640 CFM TYPICAL FOR 2 640-2

CONSTRUCTION NOTE NUMBER

DEMOLITION NOTE NUMBER EQUIPMENT DESIGNATION, (i.e. EXHAUST FAN NUMBER 1)

PIPING RISER DESIGNATION (i.e. HOT WATER RISER NUMBER 1)

— NEW SYSTEM COMPONENT - POINT OF NEW CONNECTION SYMBOL

-SHEET WHERE SECTION IS DRAWN

— PLAN NUMBER

MECHANICAL DRAWING INDEX

M-2

MECHANICAL AND PLUMBING SPECIFICATIONS

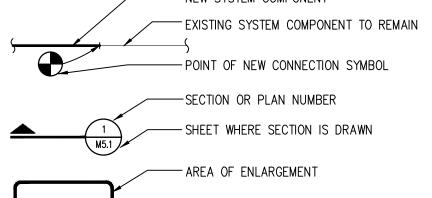
STANDARD METHODS OF NOTATION

10ø 350-4 RETURN GRILLE WITH SCHEDULE TAG "1",

EXHAUST GRILLE DESIGNATION SIMILAR.

700/200 330[°] 0A AIR TERMINAL UNIT WITH HEATING COIL, SIZE 1 700 CFM MAX / 200 CFM MIN

330 CFM MIN REQUIRED OUTSIDE AIR FOR OCCUPIED MODE



— SECTION OR PLAN NUMBER SECTION OR ENLARGED PLAN

SCALE: 1/8" = 1' - 0" - SHEET WHERE SECTION IS CUT OR ENLARGED PLAN IS REFERENCED

- SHEET WHERE ENLARGED PLAN IS DRAWN

HEAVY LINE WEIGHT INDICATES NEW WORK

LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION DASHED LINES INDICATE PIPING ROUTED BELOW SLAB OR GRADE

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

NOTE: ALL SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

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SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S BIDS & PERMITS

CONSTRUCTION DRAWN BY: CHECKED BY: REVISIONS:

DESIGN DEVELOPMENT 12/08/23 01/19/24 FINAL REVIEW OWNER REVIEW 02/12/24 03/14/24 EGAL REVIEW PERMIT & BIDS

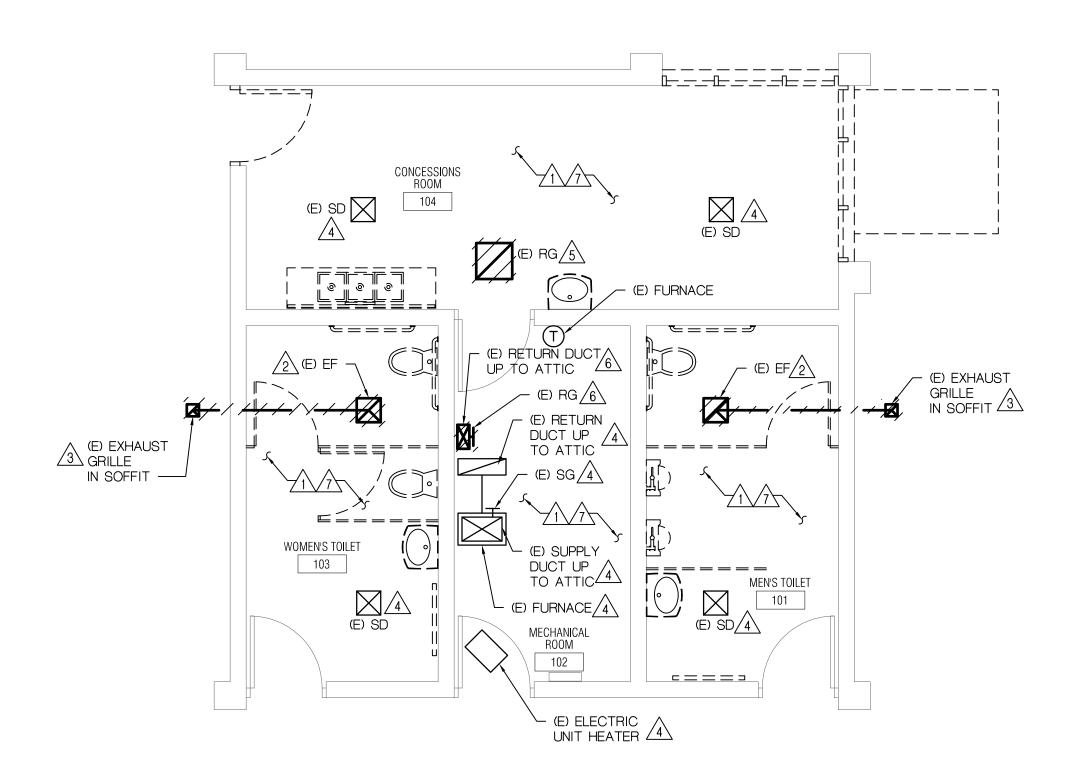
DATE: 19 SEPT. 2023

SCHEMATIC DESIGN

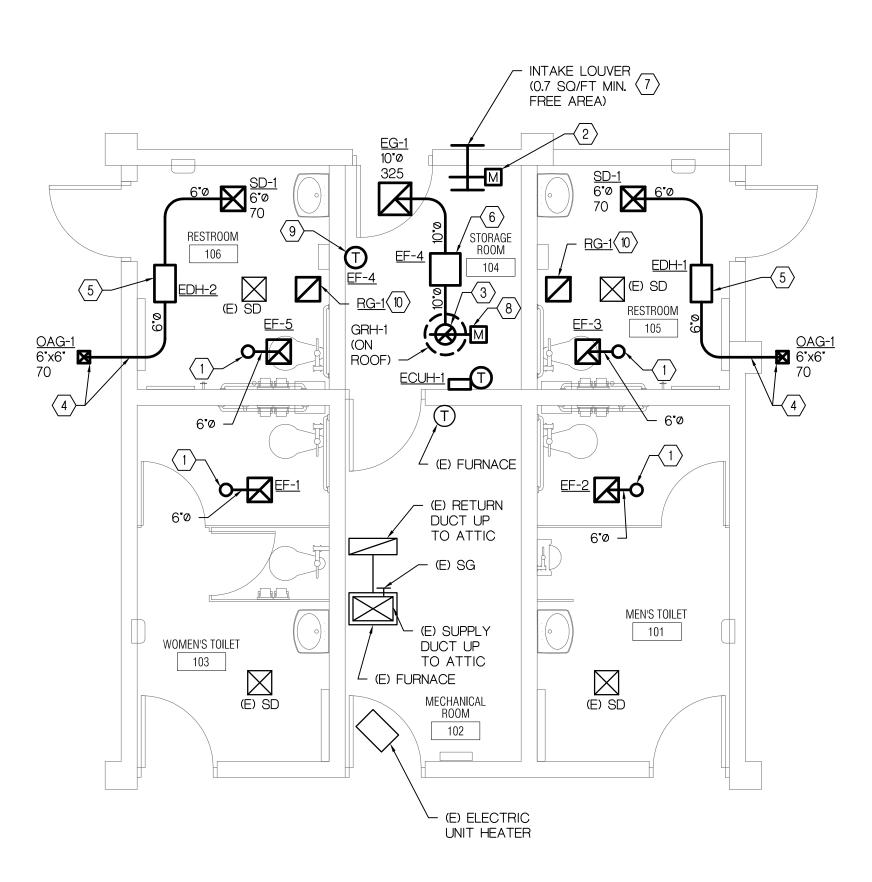
PROJECT NO.:

23-037 DRAWING NAME:

Mechanical Cover Sheet



MECHANICAL DEMOLITION FLOOR PLAN





MECHANICAL GENERAL DEMOLITION NOTES:

- ANY INTERRUPTIONS OF EXISTING SERVICES OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE BUILDING OPERATION.
- THESE DRAWINGS INDICATE THE GENERAL EXTENT OF WORK. THE EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK AND REMOVAL OF MATERIALS/COMPONENTS NOT REQUIRED FOR THE NEW AND RENOVATED SYSTEMS.
- 3. ALL MECHANICAL SYSTEMS TO BE REMOVED SHALL BE REMOVED COMPLETE WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN DUCTS. PATCH AND SEAL ALL OPENINGS AS A RESULT OF DEMOLITION IN RATED WALLS TO MAINTAIN EXISTING WALL'S FIRE OR SMOKE RATING AND TO MATCH EXISTING ADJACENT SURFACES.
- 4. ALL ITEMS AND EQUIPMENT REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS POSSESSION RIGHTS ARE WAIVED, CONTRACTOR SHALL MEET WITH THE OWNER PRIOR TO START OF DEMOLITION TO DETERMINE WHICH ITEMS ARE TO BE SALVAGED. CONTRACTOR SHALL REMOVE REMAINING ITEMS FROM SITE.
- FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO START OF DEMOLITION.
- ALL ITEMS ON THE DEMOLITION PLANS SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED.

SHEET METAL GENERAL NOTES:

- COORDINATE NEW DUCTWORK WITH SITE CONDITIONS. EQUIPMENT MANUFACTURER AND ALL OTHER TRADES TO AVOID INTERFERENCES.
- PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURERS REQUIREMENTS OR CODES REFERENCED BY THE AUTHORITY HAVING JURISDICTION., WHICHEVER IS MORE STRINGENT.
- 3. ALL CORING AND CUTTING THROUGH FLOORS, WALLS, AND ROOFS SHALL BE BY MECHANICAL CONTRACTOR.
- COORDINATE DUCTWORK ROUTING WITH OTHER TRADES TO AVOID INTERFERENCES.
- 5. BALANCE ALL AIR SYSTEMS TO INDICATED AIR FLOW RATES.
- ALL DUCTWORK SHALL BE CONCEALED IN WALLS AND/OR CEILING SPACE, UNLESS OTHERWISE NOTED. REFER TO ARCHITECTURAL PLANS.
- ALL DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE, UNLESS OTHERWISE NOTED. COORDINATE ROUTING WITH OTHER TRADES TO AVOID INTERFERENCES
- COORDINATE EXACT LOCATIONS OF ALL DIFFUSERS AND RETURN GRILLES WITH ARCHITECTURAL AND ELECTRICAL REFLECTED CEILING PLANS.
- REFER TO ARCHITECTURAL DRAWINGS FOR WALL AND CEILING CONSTRUCTION AND MATERIALS.

MECHANICAL DEMOLITION KEY NOTES:

- CONTRACTOR SHALL PERFORM A COMPLETE PRE-DEMOLITION TEST AND BALANCE OF THE AIRFLOW FOR THE EXISTING FURNACE AT MAXIMUM OPERATING CONDITION PRIOR TO COMMENCEMENT OF DEMOLITION. TEST AND BALANCE REPORT SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING.
 - TOTAL SUPPLY CFM
 - TOTAL RETURN CFM TOTAL STATIC PRESSURE
 - MANUFACTURER NAMEPLATE DATA
 - ELECTRICAL DATA (HP, VOLTAGE, PHASE, ETC.)
 - DRIVE (CONSTANT, VFD) MINIMUM OUTDOOR AIR

SUBMIT REPORT TO AE PRIOR TO START OF DEMOLITION. REPORT SHALL BE SIMILAR IN FORMAT TO A TYPICAL TEST AND BALANCE REPORT PREPARED UPON COMPLETION OF TESTING AND BALANCING A NEW SYSTEM. INFORMATION PROVIDED IN REPORT SHALL BE USED FOR VERIFICATION OF NEW EQUIPMENT CAPACITIES AND POST CONSTRUCTION BALANCE OF NEW EQUIPMENT.

- REMOVE EXISTING CEILING MOUNTED EXHAUST FAN COMPLETE INCLUDING DUCTWORK, HANGERS, CONTROLS AND ALL ASSOCIATED ACCESSORIES.
- REMOVE EXISTING EXHAUST DUCT AND EXHAUST GRILLE IN SOFFIT INCLUDING ALL HANGERS AND ASSOCIATED ACCESSORIES. SOFFIT TO BE PATCHED BY OTHERS. CONTRACTOR TO VERIFY EXACT ROUTING OF EXHAUST DUCT AND NOTIFY AE OF ANY DISCREPANCIES PRIOR TO START OF DEMOLITION.
- EXISTING TO REMAIN.
- REMOVE EXISTING RETURN AIR GRILLE AND CAP EXISTING DUCTWORK ABOVE CEILING AIR TIGHT.
- CONTRACTOR TO FIELD VERIFY WHETHER EXISTING DUCT IS A SUPPLY DUCT OR A RETURN DUCT. REPORT FINDINGS TO AE PRIOR TO START OF DEMOLITION OF DUCT AS SUBSEQUENTLY NOTED FOR REVIEW AND FURTHER DIRECTION. REMOVE EXISTING RETURN AIR DUCTWORK UP TO CEILING AND CAP DUCTWORK JUST BELOW CEILING AIR TIGHT.
- CONTRACTOR TO PREPARE COMPLETE PLAN OF ALL EXISTING SUPPLY, RETURN AND EXHAUST DUCTWORK ABOVE EXISTING CEILING INCLUDING DUCT SIZES PRIOR TO START OF DEMOLITION. PROVIDE PLAN TO AE FOR REVIEW AND FURTHER

X SHEET METAL KEY NOTES:

- 6°Ø EXHAUST DUCT UP THRU ROOF. TERMINATE WITH GOOSENECK ABOVE ROOF. REFER TO GOOSENECK DETAIL.
- PROVIDE 120 VOLT MOTORIZED DAMPER AT EXTERIOR WALL LOUVER AND INTERLOCK WITH ASSOCIATED EXHAUST FAN SUCH THAT THE MOTORIZED DAMPER OPENS WITH EXHAUST FAN IS IN OPERATION.
- 10° EXHAUST DUCT UP THRU ROOF AND TERMINATE WITH GRAVITY RELIEF HOOD GRH-1.
- 6"x6" OUTSIDE AIR GRILLE TO BE LOCATED IN SOFFIT. 6"Ø OUTSIDE AIR INTAKE DUCT TO BE ROUTED THRU SOFFIT TO ELECTRIC DUCT HEATER ABOVE RESTROOM. COORDINATE EXACT LOCATION OF GRILLE WITH ARCHITECTURAL
- ELECTRIC DUCT HEATER TO BE LOCATED IN ATTIC SPACE NEAR NEW ACCESS PANEL. COORDINATE EXACT LOCATION OF ACCESS PANEL WITH ARCHITECTURAL TRADES FOR ACCESSIBLE MAINTENANCE OF ELECTRIC DUCT
- EXHAUST FAN EF-4 TO BE LOCATED IN ATTIC SPACE NEAR NEW ACCESS PANEL. COORDINATE EXACT LOCATION OF ACCESS PANEL WITH ARCHITECTURAL TRADES FOR ACCESSIBLE MAINTENANCE OF EXHAUST FAN EF-4.
- 7. NEW INTAKE WALL LOUVER PROVIDED BY OTHERS.
- PROVIDE 120 VOLT MOTORIZED DAMPER DIRECTLY BELOW ROOF DECK AND INTERLOCK WITH ASSOCIATED EXHAUST FAN SUCH THAT THE MOTORIZED DAMPER OPENS WITH EXHAUST FAN IS IN OPERATION.
- PROVIDE LINE VOLTAGE THERMOSTAT.
- PROVIDE NEW RETURN AIR GRILLE AND BRANCH DUCTWORK WITH VOLUME DAMPER. CONNECT NEW RETURN AIR DUCTWORK TO EXISTING RETURN AIR DUCTWORK MAIN. CONTRACTOR TO PROVIDE ADEQUATELY SIZED BRANCH DUCTWORK FOR EXACTLY HALF OF THE PRE-DEMOLITION AIRFLOW OF EXISTING RETURN AIR GRILLE IN EXISTING CONCESSIONS ROOM 104. FIELD VERIFY EXISTING CONDITIONS PRIOR TO START OF CONSTRUCTION.

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33668 BARTOLA DRIVE

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PROJECT NAME:

O

SCHEMATIC DESIGN DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S BIDS & PERMITS CONSTRUCTION

DRAWN BY:

CHECKED BY: REVISIONS:

SCHEMATIC DESIGN 11/07/23 DESIGN DEVELOPMENT FINAL REVIEW 01/19/24 OWNER REVIEW EGAL REVIEW PERMIT & BIDS

DATE 19 SEPT. 2023

23-037

PROJECT NO.:

DRAWING NAME: Mechanical Floor

Plans

SHEET NO .:

WHEN USING THIS DRAWING - PLOT OR PRINT FULL SIZE TO ENSURE CORRECT SCALE. NOTE REDUCED SIZE DRAWINGS ARE NOT TO SCALE

						EXHAL	JST F	AN SCI	HEDUL	E								
												MOTOR	₹		·			
MARK	LOCATION	AREA / SYSTEM SERVED	TYPE	CFM @ 70 °F	ESP (IN WC)	TOTAL SP (IN WC)	FAN RPM	BHP	DRIVE	HP / WATTS (MIN)	RPM	VOLT	PHASE	MOTOR ENCL	FAN OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL NUMBER	NOTES
EF-1	CEILING	WOMEN'S TOILET 103	CENTRIFUGAL	140	0.30	0.30	1,050	-	DIRECT	128	-	115	1	ODP	10	GREENHECK	SP-B150	1, 2, 3
EF-2	CEILING	MEN'S TOILET 101	CENTRIFUGAL	140	0.30	0.30	1,050	-	DIRECT	128	-	115	1	ODP	10	GREENHECK	SP-B150	1, 2, 3
EF-3	CEILING	RESTROOM 105	CENTRIFUGAL	70	0.22	0.22	900	-	DIRECT	18	-	115	1	ODP	9	GREENHECK	SP-880	1, 2, 3
EF-4	ATTIC	STORAGE ROOM 104	CENTRIFUGAL IN-LINE	325	0.30	0.30	1,300	0.04	DIRECT	1/25	1,300	115	1	ODP	50	GREENHECK	SQ-90	1, 4
EF-5	CEILING	RESTROOM 106	CENTRIFUGAL	70	0.22	0.22	900	-	DIRECT	18	-	115	1	ODP	9	GREENHECK	SP-880	1, 2, 3

•	N 1007	
	NO	;

- 1. DISCONNECT SWITCH FURNISHED BY UNIT MANUFACTURER AND INSTALLED BY MECHANICAL CONTRACTOR.
- 2. PROVIDE WITH GRAVITY BACKDRAFT DAMPER.
- 3. PROVIDE WITH VIBRATION ISOLATION KIT. 4. PROVIDE WITH SPRING HUNG VIBRATION ISOLATORS.

SUPPLY AIR HOA	
STR ES THERMOSTAT	

TYPICAL ELECTRIC CABINET UNIT HEATER CONTROL DIAGRAM

- 1. DRAWING IS DIAGRAMMATIC. REFER TO THE OTHER MECHANICAL DRAWINGS AND MANUFACTURER'S EQUIPMENT DIAGRAM FOR DETAILS.
- 2. ALL SETPOINTS AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE.

SEQUENCE OF OPERATION:

- MAIN DUCT

EXHAUST AIR FLOW

SUPPLY AIR FLOW

30° MAX—

TRANSITION -

BRANCH DUCT

- 1. A THERMOSTAT SHALL CONTROL THE CABINET UNIT HEATER BASED ON TEMPERATURE SETPOINT (ADJUSTABLE). INITIAL SETPOINT SHALL BE 60 DEGREES F. PROVIDE GUARD IN PUBLIC AREAS. COORDINATE
- 2. UPON SENSING THE SPACE TEMPERATURE DROP BELOW SPACE SETPOINT (ADJUSTABLE), THE THERMOSTAT SHALL START THE FAN AND THEN ENERGIZE THE ELECTRIC HEATING COIL TO MAINTAIN SPACE TEMPERATURE (ADJUSTABLE).
- 3. UPON SENSING THE SPACE TEMPERATURE RISE ABOVE SPACE SETPOINT, THE THERMOSTAT SHALL DE-ENERGIZED THE ELECTRIC HEATING COIL AND THEN TURN OFF THE FAN TO MAINTAIN SPACE TEMPERATURE (ADJUSTABLE).

- MANUAL

DAMPER

VOLUME

4. THE THERMOSTAT SHALL MAINTAIN A SPACE SETPOINT OF 60° F (ADJUSTABLE) AND A 2° F (MINIMUM)

ACCEPTABLE DUCT TRANSITION
UNACCEPTABLE DUCT TRANSITION

RECTANGULAR DUCT
CONNECTION DETAIL
NOT TO SCALE:

1. THIS TRANSITION SHALL BE USED FOR ALL

2. AREA OF "A" THE CONNECTION IS EQUAL TO

MAIN DUCTS (SUPPLY AND EXHAUST).

1.5 TIMES AREA OF "B" THE BRANCH.

DUCT TRANSITION DETAIL NOT TO SCALE:

	ELECTRIC DUCT HEATER SCHEDULE											
				ELECTRICAL DATA DIMENSIONS								
MARK	AREA SERVED	CFM	ESP (IN WC)	ĸw	AMPS	VOLT	PHASE	INLET / OUTLET (DIA)	BOX DIMENSIONS (INCHES)	MANUFACTURER	MODEL NUMBER	NOTES
EDH-1	RESTROOM 105	70	0.2	2	12.8	208	1	6	19.5 x 10.5 x8	THERMOLEC	FER-6-2-208/1	1, 2, 3
EDH-2	RESTROOM 106	70	0.2	2	12.8	208	1	6	19.5 x 10.5 x8	THERMOLEC	FER-6-2-208/1	1, 3, 5

- DISCONNECT SWITCH FURNISHED AND INSTALLED BY MECHANICAL TRADES.
- ON/OFF CONTROL INTERFACED WITH EF-3. REFER TO ELECTRICAL DRAWINGS.
- INTERNAL THERMOSTAT TO BE SET AT 70 DEG F.
- 4. ON/OFF CONTROL INTERFACED WITH EF-5. REFER TO ELECTRICAL DRAWINGS.

			GR	RAVITY	/ REL	IEF HO	OOD SC	HEDUI	E			
					ROOF	THROAT	HOOD					
MARK	AREA / SYSTEM SERVED	LOCATION	CFM	SP DROP IN WG	CURB HEIGHT (IN)	DIA. (IN)	HOOD MATERIAL	HEIGHT (IN)	DIA. (IN)	MANUFACTURER	MODEL NUMBER	NOTES
GRH-1	STORAGE ROOM 104	ROOF	325	0.2	18	10.25	ALUMINUM	9	20.5	GREENHECK	GRSR-10	1, 2

1. PROVIDE MOTORIZED DAMPER, 120 VOLT.

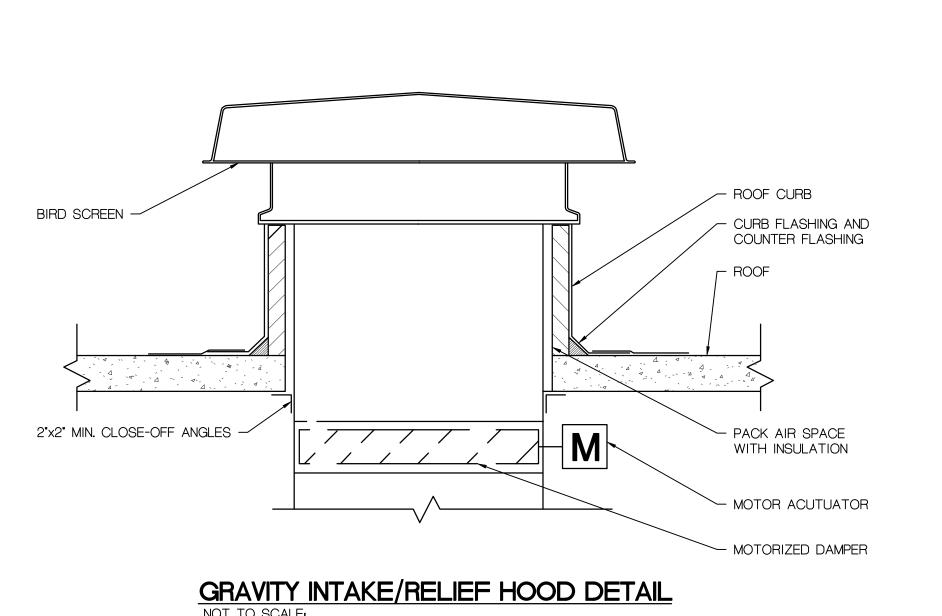
2. PROVIDE WITH PITCHED ROOF CURB, GREENHECK MODEL GPIP. CONTRACTOR TO VERIFY ROOF SLOPE PRIOR TO ORDERING.

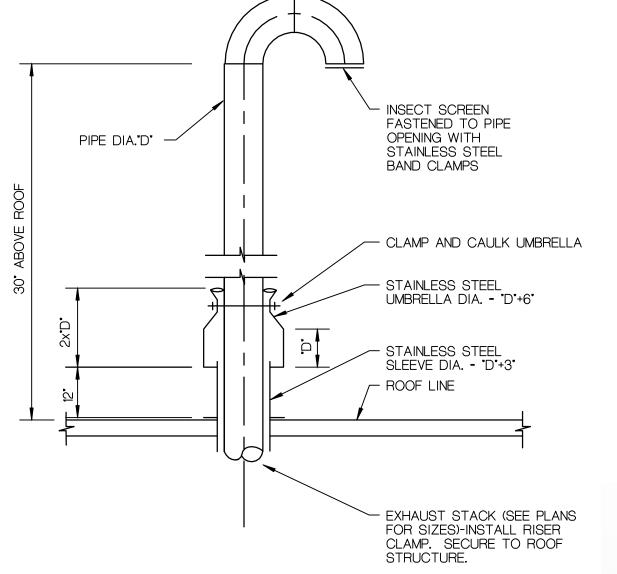
DIFFUSER-REGISTER-GRILLE SCHEDULE										
MARK	FLOW RANGE (CFM)	DIFFUSER FACE SIZE (IN)	DIFFUSER NECK SIZE (IN)	FLOW PATTERN	MOUNTING TYPE	COLOR	MATERIAL	MANUFACTURER	MODEL NUMBER	NOTES
EG-1	SEE PLANS	16"x16"	SEE PLANS	PERFORATED	SURFACE	WHITE	STEEL	PRICE	PDDR	1
RG-1	SEE PLANS	12"x12"	SEE PLANS	PERFORATED	SURFACE	WHITE	STEEL	PRICE	PDDR	1
OAG-1	SEE PLANS	D + 1 3/4"	D- 3/4"	45 DEG DEFLECTION	SURFACE	WHITE	STEEL	PRICE	530	1
SD-1	SEE PLANS	12"x12"	SEE PLANS	360 DEG RADIAL HORIZONTAL	SURFACE	WHITE	STEEL	PRICE	SCD	1

1. REFER TO REFLECTED CEILING PLANS EXACT LOCATION. PROVIDE ALL FRAMES AND ACCCESSORIES AS REQUIRED FOR PROPER INSTALLATION.

			El	ECTRIC	CABIN	IET U	NIT H	EATE	R SC	HEDU	LE		
MARK	AREA SERVED	AIR FLOW (CFM) @ 70 DEG F	втин	ELECTRICAL DATA				HEATER					
				WATTS	AMPS	VOLT	PHASE	WIDTH (IN)	HEIGHT (IN)	DEPTH (IN)	MANUFACTURER	MODEL NUMBER	NOTES
ECUH-1	STORAGE 104	65	3413 / 1706	1000 / 500	8.4 / 4.2	120	1	11	13	5	Q-MARK	CWH1101DSF	1, 2, 3

- INTERGRAL THERMOSTAT AND DISCONNECT.
- 2. HEAVY DUTY CONSTRUCTION WITH TAMPER PROOF GRILLE COVER.
- 3. SURFACE MOUNTED.





MARKO V. LAWRIN GOOSENECK DETAIL NOT TO SCALE!

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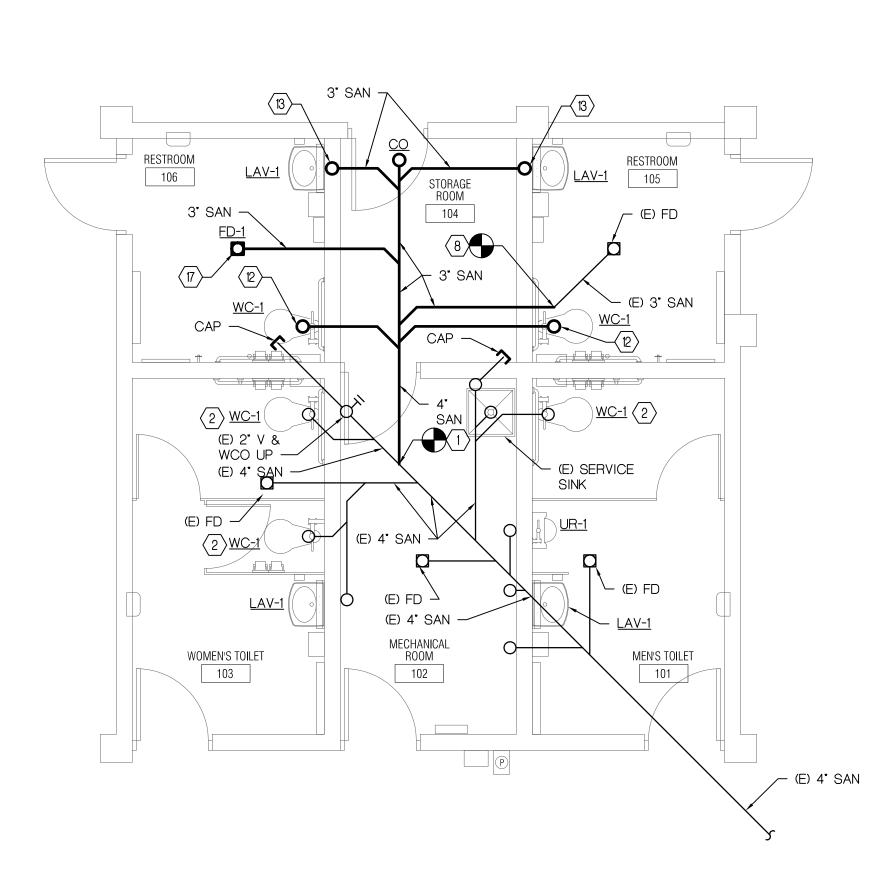
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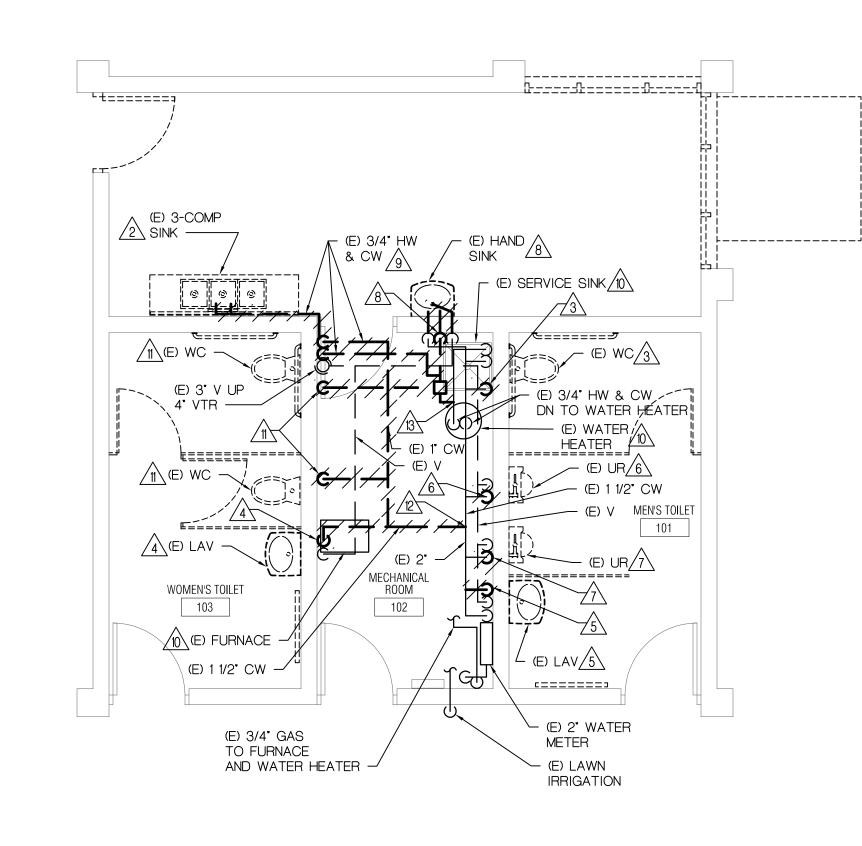
DATE: 19 SEPT. 2023

PROJECT NO.:

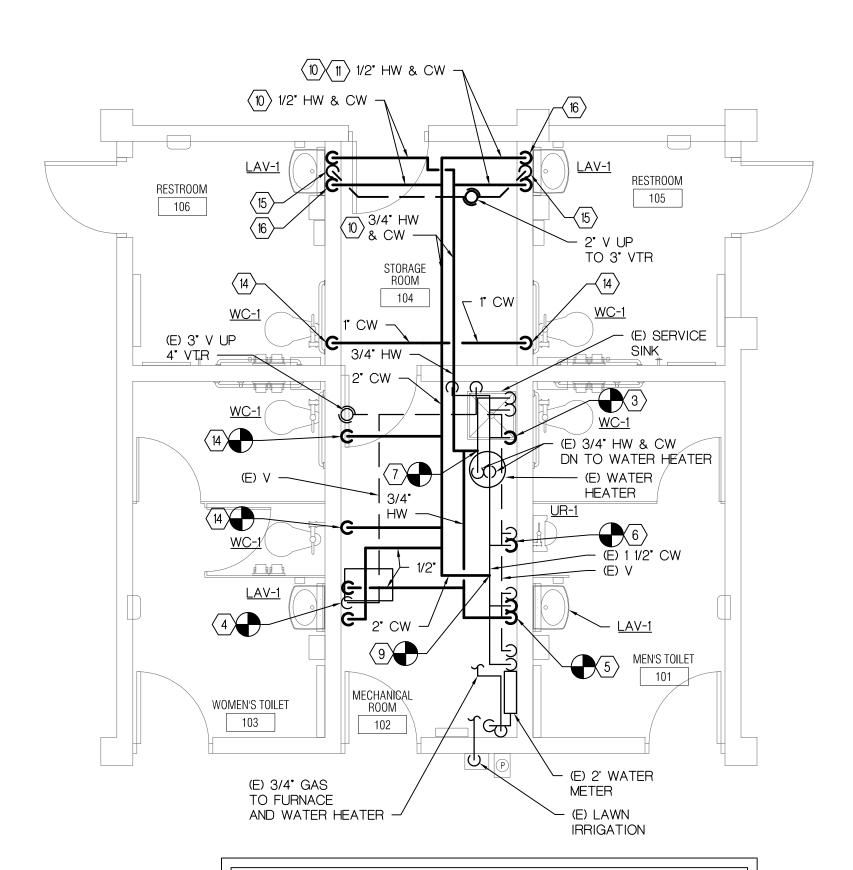
23-037 DRAWING NAME: Mechanical Details and







PLUMBING DEMOLITION ABOVEGROUND FLOOR PLAN



CONTRACTOR TO PROVIDE NEW PIPE INSULATION ON ALL NEW AND EXISTING DOMESTIC HOT WATER AND COLD WATER PIPING. CONTRACTOR TO PERFORM A SITE VISIT PRIOR TO BIDDING TO UNDERSTAND THE FULL EXTENT OF PIPE INSULATION REQUIRED ON EXISTING PIPING.

ALL PLUMBING SYSTEMS TO BE REMOVED SHALL BE REMOVED COMPLETE WITH

THESE DRAWINGS INDICATE THE GENERAL EXTENT OF WORK. THE EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK AND REMOVAL OF MATERIALS/COMPONENTS NOT REQUIRED FOR THE NEW AND RENOVATED

REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE BUILDING OPERATION

PLUMBING GENERAL DEMOLITION NOTES:

PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S

ANY INTERRUPTIONS OF EXISTING SERVICES OR EQUIPMENT SHALL BE

- ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, ETC. CAP ALL OPEN PIPES PATCH AND SEAL ALL OPENINGS AS A RESULT OF DEMOLITION IN RATED WALLS TO MAINTAIN EXISTING WALL'S FIRE OR SMOKE RATING AND TO MATCH EXISTING ADJACENT SURFACES.
- ALL ITEMS AND EQUIPMENT REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS POSSESSION RIGHTS ARE WAIVED. CONTRACTOR SHALL MEET WITH THE OWNER PRIOR TO START OF DEMOLITION TO DETERMINE WHICH ITEMS ARE TO BE SALVAGED. CONTRACTOR SHALL REMOVE REMAINING ITEMS FROM
- FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO START OF DEMOLITION.
- 6. ALL ITEMS ON THE DEMOLITION PLANS SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED.
- 7. PLUMBING DEMOLITION CONTRACTOR SHALL COORDINATE CUTTING AND PATCHING OF FLOORS, WALLS, AND CEILINGS WITH GENERAL CONTRACTOR PRIOR TO PERFORMING WORK.

PLUMBING GENERAL NOTES:

- THESE DRAWINGS INDICATE THE GENERAL EXTENT OF WORK BUT ARE NOT FABRICATION DRAWINGS. COORDINATE PLUMBING SYSTEMS WITH WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS, TRANSITIONS, ETC. AS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
- 2. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL NEW PLUMBING FIXTURES.
- 3. ALL PLUMBING RELATED CORING THROUGH FLOORS SHALL BE BY PLUMBING CONTRACTOR.
- COORDINATE ALL NEW LOCATIONS, SIZES AND ELEVATIONS OF SLEEVES THROUGH WALLS, SLABS AND FOUNDATIONS WITH STRUCTURAL DRAWINGS AND FIELD CONDITIONS.
- COORDINATE ALL PIPE ROUTING WITH SITE CONDITIONS, EQUIPMENT MANUFACTURER'S RECOMMENDATIONS, AND ALL OTHER TRADES TO AVOID INTERFERENCES.
- PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
- 7. ALL OVERHEAD DOMESTIC WATER PIPING SHALL BE INSULATED AND LABELED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
- 8. SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AIR AND WATER TIGHT.
- 9. CONTRACTOR SHALL MAINTAIN ADEQUATE CLEARANCES (PER THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE) ABOVE AND AROUND ANY NEW
- 10. RUN ALL SANITARY AND VENT PIPING AT SLOPES COMPLYING WITH THE MICHIGAN

ELECTRICAL PANELS, EQUIPMENT, AND TRANSFORMERS WHEN ROUTING OVERHEAD

- PLUMBING CODE LATEST EDITION.
- 11. PROVIDE SHUT-OFF VALVES AT ALL PLUMBING FIXTURES.
- MINIMUM UNDERGROUND SANITARY PIPING SHALL BE 3". TRANSITION IN VERTICAL TO SMALLER SIZES INDICATED TO FIXTURES.
- 13. REFER TO PIPING DIAGRAMS, DETAILS, AND SPECIFICATIONS FOR VALVES, FITTINGS, AND OTHER ACCESSORIES.
- 14. REFER TO ARCHITECTURAL DRAWINGS FOR WALL AND CEILING CONSTRUCTION AND MATERIALS.

PLUMBING ABOVEGROUND FLOOR PLAN

- REMOVE EXISTING FLOOR SINK COMPLETE. CAP SANITARY PIPING BELOW FINISHED FLOOR. FINISHED FLOOR TO BE PATCH BY ARCHITECTURAL TRADES.
- REMOVE EXISTING 3-COMP SINK COMPLETE INCLUDING BUT NOT LIMITED TO ALL ASSOCIATED HANGERS, PIPING AND TRIM COMPLETE.
- REMOVE EXISTING WC COMPLETE. EXISTING UNDERGROUND SAN TO REMAIN FOR CONNECTION TO NEW WC. REMOVE EXISTING CW FLUSH VALVE ASSEMBLY IN MECHANICAL ROOM 102 AND PREPARE EXISTING CW PIPING FOR NEW
- REMOVE EXISTING LAV COMPLETE. EXISTING SAN AND VENT TO REMAIN FOR CONNECTION TO NEW LAV. EXISTING CW TO BE REMOVED AS INDICATED BACK TO MAIN. REFER TO NEW WORK PLANS FOR NEW WORK.

CONNECTION. REFER TO NEW WORK PLANS FOR NEW WORK.

- REMOVE EXISTING LAV COMPLETE. EXISTING CW, SAN AND VENT TO BE CAPPED IN MECHANICAL ROOM 102.
- REMOVE EXISTING UR COMPLETE. EXISTING SAN AND VENT TO REMAIN FOR CONNECTION TO NEW UR. REMOVE EXISTING CW FLUSH VALVE ASSEMBLY IN MECHANICAL ROOM 102 AND PREPARE EXISTING CW PIPING FOR NEW CONNECTION. REFER TO NEW WORK PLANS FOR NEW WORK.
- REMOVE EXISTING UR COMPLETE. EXISTING SAN AND VENT TO REMAIN FOR CONNECTION TO NEW LAV IN SAME LOCATION. REMOVE EXISTING CW FLUSH VALVE ASSEMBLY IN MECHANICAL ROOM 102 AND PREPARE EXISTING CW PIPING FOR NEW CONNECTION TO NEW LAV IN SAME LOCATION. REFER TO NEW WORK PLANS FOR NEW WORK.
- REMOVE EXISTING HAND SINK COMPLETE INCLUDING BUT NOT LIMITED TO ALL ASSOCIATED HANGERS, PIPING AND TRIM COMPLETE, EXISTING CW. SAN AND VENT TO BE CAPPED IN MECHANICAL ROOM 102. EXISTING WALL TO BE PATCHED BY ARCHITECTURAL TRADES.
- REMOVE EXISTING HW AND CW PIPING AS INDICATED AND PREPARE EXISTING PIPING FOR NEW CONNECTION. REFER TO NEW WORK PLANS FOR NEW WORK.
- 10. EXISTING FIXTURE/EQUIPMENT TO REMAIN.
- REMOVE EXISTING WC COMPLETE. EXISTING UNDERGROUND SAN TO REMAIN FOR CONNECTION TO NEW WC. REMOVE EXISTING CW FLUSH VALVE ASSEMBLY AND COLD WATER PIPING AS INDICATED IN MECHANICAL ROOM 102. REFER TO NEW WORK PLANS FOR NEW WORK.
- 12. REMOVE EXISTING 1 1/2" CW BACK TO 2" CW MAIN AS INDICATED. PREPARE EXISTING CW PIPING FOR NEW CONNECTION TO EXISTING 2" MAIN. REFER TO NEW WORK PLANS FOR NEW WORK.
- 13. REMOVE EXISTING HW BACK TO 3/4" HW MAIN AS INDICATED. PREPARE EXISTING HW PIPING FOR NEW CONNECTION TO EXISTING 3/4" MAIN. REFER TO NEW WORK PLANS FOR NEW WORK.
- 14. REMOVE PORTION OF EXISTING 3" SAN PIPING AS INDICATED. FIELD VERIFY EXACT LOCATION AND INVERT ELEVATION. PREPARE EXISTING 3" SAN PIPE FOR NEW CONNECTION. REFER TO NEW WORK PLANS FOR NEW WORK.
- 15. CAP EXISTING 3" SAN PIPING. FIELD VERIFY EXACT LOCATION AND INVERT ELEVATION.
- 16. EXISTING UNDERGROUND PIPE ROUTING AND SIZES AS SHOWN ON CONSTRUCTION DOCUMENTS ARE PER EXISTING DRAWINGS PROVIDED BY OWNER. CONTRACTOR SHALL CAMERA EXISTING UNDERGROUND PIPING IN BUILDING IN ITS ENTIRETY AND PROVIDE FLOOR PLAN TO AE WHICH INCLUDES ROUTING, SIZES, CONDITION, MATERIAL AND INVERTS OF PIPE PRIOR TO START OF DEMOLITION. CONTRACTOR SHALL ALSO DETERMINE WHETHER NEW UNDERGROUND SANITARY PIPE INVERT ELEVATION WILL ALLOW FOR CONNECTION TO EXISTING UNDERGROUND SANITARY PIPE IN MECHANICAL ROOM 102 AS INDICATED ON PLAN. AE TO REVIEW PLAN SUBMITTED BY CONTRACTOR FOR DETERMINATION OF ANY REVISIONS WHICH MAY BE REQUIRED TO ACCOMMODATE NEW WORK.

PLUMBING KEY NOTES:

- CONNECT NEW 4" SANITARY PIPING TO EXISTING SANITARY MAIN. FIELD VERIFY EXACT LOCATION AND INVERT PRIOR TO START OF CONSTRUCTION.
- NEW WC-1. CONNECT EXISTING SAN PIPING TO NEW WC-1. MODIFY EXISTING SAN PIPING AS REQUIRED FOR INSTALLATION OF NEW WC-1.
- 3. NEW WC-1. CONNECT NEW 1' CW TO EXISTING 1' CW AND EXTEND PIPING TO NEW WC-1. PROVIDE NEW ISOLATION VALVE AT PLUMBING FIXTURE. MODIFY EXISTING CW PIPING AS REQUIRED FOR INSTALLATION OF NEW WC-1.
- 4. NEW LAV-1. CONNECT EXISTING SAN AND VENT PIPING TO NEW LAV-1. PROVIDE NEW 1/2' HW AND CW TO LAV-1. PROVIDE NEW ISOLATION VALVES AT PLUMBING FIXTURE. MODIFY EXISTING PIPING AS REQUIRED FOR INSTALLATION OF NEW
- 5. NEW LAV-1. CONNECT EXISTING SAN AND VENT PIPING TO NEW LAV-1. PROVIDE NEW 1/2" HW TO LAV-1. CONNECT NEW 1/2" CW TO EXISTING 1/2" CW AND EXTEND TO NEW LAV-1. PROVIDE NEW ISOLATION VALVES AT PLUMBING FIXTURE. MODIFY EXISTING PIPING AS REQUIRED FOR INSTALLATION OF NEW LAV-1.
- NEW UR-1. CONNECT EXISTING CW, SAN AND VENT PIPING TO NEW UR-1. PROVIDE NEW ISOLATION VALVE AT PLUMBING FIXTURE. MODIFY EXISTING PIPING AS REQUIRED FOR INSTALLATION OF NEW LAV-1.
- 7. CONNECT NEW 3/4" HW TO EXISTING. FIELD VERIFY EXACT LOCATION, ELEVATION AND CONNECTION SIZE PRIOR TO START OF CONSTRUCTION.
- CONNECT NEW 3' SANITARY PIPING TO EXISTING SANITARY BRANCH. FIELD VERIFY EXACT LOCATION AND INVERT PRIOR TO START OF CONSTRUCTION.
- CONNECT NEW 2'CW TO 2'EXISTING CW. FIELD VERIFY EXACT LOCATION, ELEVATION AND CONNECTION SIZE PRIOR TO START OF CONSTRUCTION.
- 10. NEW HW AND CW PIPING TO BE ROUTED EXPOSED HIGH AS POSSIBLE TO UNDERSIDE OF CEILING. FIELD VERIFY EXACT ROUTING PRIOR TO START OF CONSTRUCTION TO AVOID INTERFERENCES WITH LIGHTS, DIFFUSERS, ACCESS PANELS AND ECT.
- 11. CONTRACTOR TO COORDINATE ROUTING OF HW AND CW PIPING WITH ELECTRICAL TRADES TO MAINTAIN ADEQUATE CLEARANCE (PER THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE) ABOVE AND AROUND ANY ELECTRICAL PANELS, EQUIPMENT AND TRANSFORMERS WHEN ROUTING OVERHEAD
- 12. 4" SAN UP TO WC-1.
- 13. 3" SAN UP TO LAV-1.
- 14. 1' CW DN IN WALL TO WC-1. PROVIDE NEW ISOLATION VALVE AT PLUMBING FIXTURE.
- 15. 1 1/4" SAN AND VENT TO LAV-1.
- 16. 1/2" HW AND CW DN IN WALL TO LAV-1. PROVIDE NEW ISOLATION VALVES AT PLUMBING FIXTURE.
- 17. 3" SAN UP TO FD-1.



Plans SHEET NO .:

WHEN USING THIS DRAWING - PLOT OR PRINT FULL SIZE TO ENSURE CORRECT SCALE. NOTE REDUCED SIZE DRAWINGS ARE NOT TO SCALE

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PROJECT NAME:

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Suite 350 East - #4265

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SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S BIDS & PERMITS

CONSTRUCTION DRAWN BY:

CHECKED BY: REVISIONS:

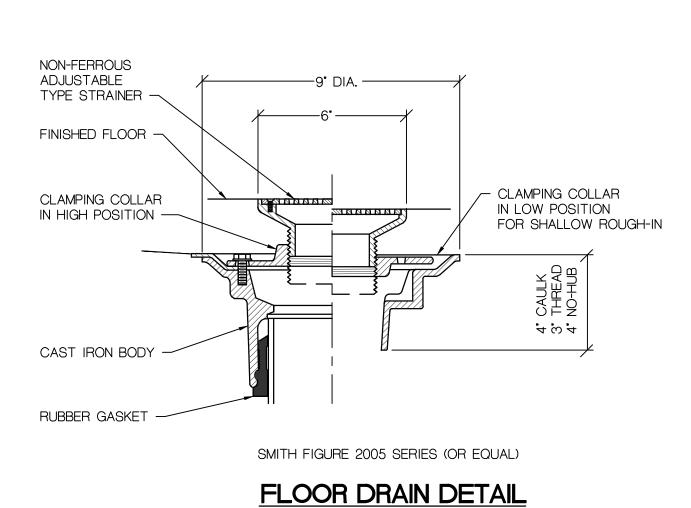
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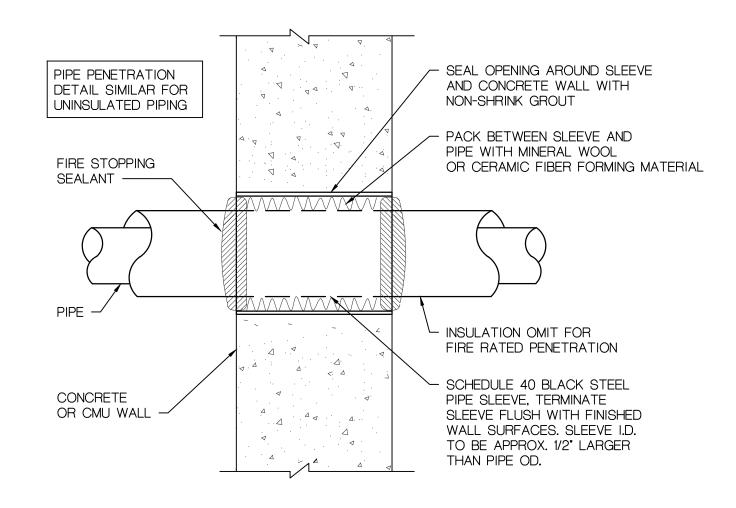
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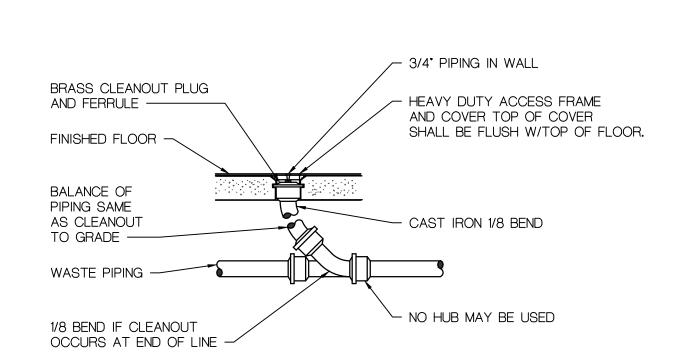
23-037 DRAWING NAME: Plumbing Floor

	PLUMBING FIXTURE SCHEDULE								
MARK	FIXTURE	MATERIAL/COLOR	MANUFACTURER/ MODEL NUMBER	CW	НW	WASTE	VENT	COMMENTS	
WC-1	WATER CLOSET (ADA)	VITREOUS CHINA/WHITE	KOHLER MODEL K-96057-SS	1"	-	4"	2 ^h	FLOOR MOUNTED "HIGHCLIFF" ULTRA MODEL (ADA), FLOOR OUTLET, ELONGATED BOWL, 1.6 GPF. PROVIDE LUSTRA ELONGATED OPEN FRONT SEAT WITH ANTI-MICROBIAL AGENT AND CHECK HINGE. PROVIDE WITH SLOAN ROYAL MANUAL FLUSHOMETER FLUSH VALVE MODEL 111-1.6-1-OFST. INSTALLATION SHALL BE ADA COMPLIANT.	
LAV-1	LAVATORY	VITREOUS CHINA/WHITE	KOHLER MODEL K-2005	1/2"	1/2"	1 1/4"	1 1/4"	VITREOUS CHINA "KINGSTON" WALL MOUNTED LAVATORY WITH OVERFLOW. BOWL DIMENSIONS 21"Lx18"W. PROVIDE DECK MOUNTED, POLISHED CHROME, 0.5 GPM ZURN SINGLE CONTROL FAUCET MODEL Z81000-XL. CHROME PLATED BRASS GRID STRAINER, P-TRAP WITH CLEAN OUT PLUG, QUARTER-TURN ANGLE SUPPLIES AND STOP VALVES AND INSULATE EXPOSED WASTE AND WATER PIPING. PROVIDE MX-1 MIXING VALVE BENEATH LAVATORY.	
UR-1	URINAL.	VITREOUS CHINA/WHITE	KOHLER K-4991-ET	3/4"	-	2"	1 1/2"	WALL MOUNTED "BARDON" HIGH EFFICIENCY URINAL WITH 3/4" TOP SPUD, 1.0 GPF. PROVIDE WITH SLOAN REGAL MAUNAL FLUSHOMETER FLUSH VALVE MODEL #186-1.0-XYV.	
FD-1	FLOOR DRAIN	CAST IRON BODY/ NICKEL BRONZE	JAY R. SMITH 2005Y	*	Ψ	SEE PLANS	*	6" SQUARE ADJUSTABLE, NICKEL BRONZE STRAINER WITH SURESEAL WATERLESS TRAP PRIMER. VANDAL-PROOF SECURITY TYPE	
MX-1	POINT-OF-USE MIXING VALVE		LEONARD 170A-LF	-)#	u-	-	ASSE 1070 UNDER THE COUNTER TYPE THERMOSTATIC MIXING VALVE.	
co	FLOOR CLEANOUT	CAST IRON BODY/ NICKEL BRONZE	JAY R. SMITH 4020	-	-	SEE PLANS	-		





FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR CMU BLOCK WALL PIPE PENETRATION DETAIL NOT TO SCALE:



FLOOR CLEANOUT DETAIL



33668 BARTOLA DRIVE STERLING HEIGHTS MI 48312 586.436.0187

jfrarchitects@gmail.com www.jfrarchitects.com

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*** DO NOT SCALE DRAWINGS ***

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LE No. 23-0105 PROJECT NAME:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S BIDS & PERMITS CONSTRUCTION

DRAWN BY: CHECKED BY: REVISIONS: SCHEMATIC DESIGN

DESIGN DEVELOPMENT 11/07/23 FINAL REVIEW OWNER REVIEW EGAL REVIEW

12/08/23 01/19/24 02/12/24 03/14/24 PERMIT & BIDS DATE:

19 SEPT. 2023

PROJECT NO.:

23-037 DRAWING NAME: Plumbing Details and

Schedules

ALL MECHANICAL WORK AND MATERIALS SHALL COMPLY WITH, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING:

> MICHIGAN MINIMUM DESIGN STANDARDS FOR HEALTH CARE FACILITIES MICHIGAN BUILDING CODE (MBC) MICHIGAN MECHANICAL CODE (MMC) MICHIGAN PLUMBING CODE (MPC) AMERICANS WITH DISABILITIES ACT (ADA) STATE OF MICHIGAN DLEG BUREAU OF FIRE SERVICES LOCAL CODES, ORDINANCES AND REGULATIONS ASHRAE STANDARD 15 ASHRAE STANDARD 62.1 AHSRAE STANDARD 90.1 ASHRAE STANDARD 55

ALL OTHER APPLICABLE ASHRAE STANDARDS NFPA 13 NFPA 90A ALL OTHER APPLICABLE NFPA STANDARDS

INSTALL EQUIPMENT AND MATERIALS IN COMPLIANCE WITH THE FOLLOWING AND PROVIDE EQUIPMENT AND MATERIALS THAT CONFORM TO THE APPLICABLE STANDARDS OF THE FOLLOWING ORGANIZATIONS:

> AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) UNDERWRITERS LABORATORIES (UL) MET LABORATORIES (MET)

4. PRIOR TO SUBMITTING THE BID, REQUEST CLARIFICATION, IN WRITING, OF ANY AMBIGUITIES, QUESTIONS, UNCERTAINTIES, ETC. REQUESTS SHALL BE MADE IN WRITING A MINIMUM OF TEN (10) DAYS BEFORE THE BID DUE DATE. NO ALLOWANCES OR EXTRA CONSIDERATION IN BEHALF OF THE CONTRACTOR WILL SUBSEQUENTLY BE ALLOWED BECAUSE OF ERROR OR FAILURE ON THE PART OF THE CONTRACTOR TO CONFORM TO THE REQUIREMENTS DESCRIBED HEREIN AND TO UNDERSTAND THE EXISTING CONDITIONS.

MECHANICAL WORK, INCLUDING DEMOLITION, SHALL BE PERFORMED IN A SEQUENCE AS REQUIRED TO ACCOMMODATE CONSTRUCTION PHASING REQUIREMENTS. CONTRACTOR SHALL REVIEW PROJECT PHASING REQUIREMENTS AND ARRANGE DEMOLITION WORK ACCORDINGLY. ALL COSTS RELATED TO CONSTRUCTION PHASING REQUIREMENTS SHALL BE INCLUDED IN THE BID.

ANY DISRUPTIVE WORK SHALL BE COMPLETED DURING NON-PUBLIC HOURS AS COORDINATED WITH THE OWNER.

7. ALL MATERIALS AND EQUIPMENT SHALL BE APPLIED, INSTALLED, WIRED AND CONNECTED IN ACCORDANCE WITH ITS UL LISTING.

8. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. WHERE INSTRUCTIONS ARE NOT PROVIDED WITH THE EQUIPMENT, INCLUDING OWNER FURNISHED EQUIPMENT, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING THE INSTRUCTIONS PRIOR TO INSTALLATION.

THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND OPERATION OF THE HVAC AND PLUMBING SYSTEMS.

10. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATION AND ARRANGEMENT OF ALL THE EQUIPMENT, DUCTWORK, AND PIPING. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER NECESSARY WORK WILL PERMIT.

THE MECHANICAL CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES, APPLICABLE STANDARDS, AND THE 6. ALL DOMESTIC WATER PIPING INSULATION FOR PIPES 1° AND SMALLER SHALL MANUFACTURER'S WRITTEN INSTRUCTIONS.

12. THE MECHANICAL CONTRACTOR SHALL VISIT THE JOB SITE TO INTERPRET THE DRAWINGS AND DETERMINE THE FULL EXTENT OF THE WORK REQUIRED.

13. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING REQUIRED FOR THE SYSTEMS INDICATED. ALL WIRING AND CONDUIT SHALL BE IN COMPLIANCE WITH THE ELECTRICAL REQUIREMENTS OF THE PROJECT.

14. ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES FOR MECHANICAL WORK SHALL BE SECURED AND PAID FOR BY THE MECHANICAL CONTRACTOR. ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, RULES, AND REGULATIONS.

15. THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL SLEEVES WHEREVER PIPES PASS THROUGH FOUNDATIONS, WALLS, FLOORS AND CEILINGS. SLEEVES SHALL BE SCHEDULE 40 STEEL PIPE CUT TO LENGTH. SLEEVES SHALL TERMINATE FLUSH WITH WALLS. PARTITIONS AND CEILINGS IN FINISHED AREAS. PROVIDE CAST BRASS NICKEL-PLATED ESCUTCHEONS WITH POSITIVE CATCHES AT EACH SLEEVE IN FINISHED AREAS.

16. SEAL THE SPACE AROUND PIPES IN SLEEVES AND AROUND DUCT OPENINGS THROUGH WALLS, FLOORS AND CEILINGS. SEALANT SHALL BE JOHNS MANVILLE DUXSEAL OR TREMCO ACOUSTICAL SEALANT. FOR PENETRATIONS OF RATED WALLS, THE MECHANICAL CONTRACTOR SHALL PROVIDE A UL LISTED FIRE RATED ASSEMBLY MEETING OR EXCEEDING THE RATING OF THE PENETRATED WALL.

17. ALL CUTTING, PATCHING AND REPAIR WORK SHALL BE DONE BY THE TRADES WHO INSTALLED THE WORK AND PAID FOR BY THE TRADES FOR WHOM THE WORK IS DONE.

18. MECHANICAL CONTRACTOR SHALL PROVIDE COMPLETE OPERATING AND MAINTENANCE MANUALS TO THE OWNER COVERING ALL MECHANICAL EQUIPMENT HEREIN SPECIFIED, TOGETHER WITH PARTS LISTS.

19. SHOP DRAWINGS

A. NO APPARATUS OR EQUIPMENT SHALL BE SHIPPED FROM STOCK OR FABRICATED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND STAMPED REVIEW COMPLETED.

B. SUBMIT FOR APPROVAL, SHOP DRAWINGS FOR ALL EQUIPMENT LISTED BELOW. WHERE ITEMS ARE REFERRED TO BY SYMBOL NUMBERS ON THE DRAWINGS AND SPECIFICATIONS, ALL SUBMITTALS SHALL BEAR THE SAME SYMBOL NUMBERS. ALL DRAWING SHALL CONTAIN THE PROJECT NAME AND PROJECT NUMBER. NO LOOSE SHEETS SHALL BE SUBMITTED UNLESS A COVER SHEET IS ATTACHED.

PLUMBING FIXTURES

DOMESTIC WATER PIPING

INSULATION

IV. VALVES

SANITARY PIPING HANGERS AND SUPPORTS

TESTING, ADJUSTING AND BALANCING VIII. GRILLES, REGISTERS AND DIFFUSERS

IX. EXHAUST FANS

ELECTRIC DUCT HEATER XI. MOTORIZED DAMPER

XII. MECHANICAL LABEL IDENTIFICATION XIII. GRAVITY RELIEF HOOD XIV. ELECTRIC CABINET UNIT HEATER

20. DIELECTRIC UNIONS AS MANUFACTURED BY EPCO SHALL BE USED TO CONNECT DISSIMILAR METALS (SUCH AS STEEL AND COPPER) TO PREVENT ELECTROLYTIC ACTION. DIELECTRIC UNIONS SHALL BE MANUFACTURED BY EPCO SALES, INC., CLEVELAND, OHIO.

BASIC MATERIALS AND METHODS

1. MATERIALS TESTS

A. THE MECHANICAL CONTRACTOR SHALL GUARANTEE THAT THE ENTIRE INSTALLATION OF THE DUCT SYSTEMS WILL FUNCTION SATISFACTORILY AGAINST THE SPECIFIED SYSTEM PRESSURES. DEFECTS DUE TO IMPROPER MATERIALS, WORKMANSHIP, AND LEAKS SHALL BE CORRECTED WITHOUT ADDITIONAL COST TO THE OWNER. OTHER WORK AFFECTED AS A RESULT OF THE ABOVE MENTIONED DEFECTS SHALL ALSO BE MADE GOOD WITHOUT COST TO THE THE ENTIRE SYSTEM SHALL BE LEFT IN PROPER OPERATING CONDITION, ACCEPTABLE TO THE ENGINEERS FIELD REPRESENTATIVE.

B. FOLLOWING THE COMPLETION OF THE TESTING AND BALANCING, THE MECHANICAL CONTRACTOR SHALL EXECUTE A PERFORMANCE TEST OF THE ENTIRE HVAC SYSTEM TO DEMONSTRATE THAT SPECIFIED CAPACITIES AND PROPER CONTROL FUNCTIONING HAS BEEN ATTAINED.

PLUMBING AND PIPING SYSTEMS

1. GRAVITY-FLOW SANITARY AND VENT SHALL BE ANY OF THE FOLLOWING.

ABOVEGROUND - SERVICE CLASS, HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS, GASKETS, AND COMPRESSION JOINTS.

ABOVEGROUND - HUBLESS CAST-IRON SOIL PIPE AND FITTINGS, STANDARD SHIELDED, STAINLESS-STEEL COUPLINGS, AND HUBLESS-COUPLING JOINTS.

C. UNDERGROUND - SOLID WALL PVC PIPE, PVC SOCKETS FITTINGS AND SOLVENT CEMENTED JOINTS. ASTM D2665 PVC PIPE, ASTM D2665 MADE TO ASTM D3311 PVC SOCKET FITTINGS, ASTM D2564 SOLVENT CEMENT.

2. DOMESTIC COLD WATER AND DOMESTIC HOT WATER SHALL BE THE FOLLOWING.

A. TYPE L HARD DRAWN SEAMLESS COPPER TUBE, ASTM B88. MUELLER STREAMLINE OR EQUAL.

TUBING JOINTS SHALL BE LEAD FREE SOLDER TYPE, WITH 95-5 TIN-ANTIMONY SOLDER, OR SILVABRITE 100 ASTM B32.

C. FITTINGS SHALL BE WROUGHT COPPER SOLDER JOINT, ANSI B16.22.

1. DOMESTIC WATER PIPING SHALL BE INSULATED AS FOLLOWS.

ALL INSULATION MATERIALS SHALL BE CLASS A BY U.L. STANDARD PIPING FIBERGLASS INSULATION SHALL BE MINIMUM 5 LB. DENSITY AND SHALL HAVE UL RATING NOT EXCEEDING 25 FLAME SPREAD, 35 FUEL CONTRIBUTED, AND 50 SMOKE DEVELOPED. ACCESSORIES SUCH AS ADHESIVE, MASTICS, CEMENTS. AND CLOTH FOR FITTINGS SHALL BE PERMANENTLY FIRE AND SMOKE RESISTANT. CHEMICALS USED FOR TREATING PAPER IN JACKET LAMINATES SHALL BE UNAFFECTED BY WATER OR HUMIDITY.

INSULATE FITTINGS AND VALVES. DO NOT INSULATE FLEXIBLE CONNECTIONS AND EXPANSION JOINTS. TERMINATE INSULATION NEATLY WITH PLASTIC MATERIAL TROWELLED ON BEVEL.

4. INSULATION SHALL BE APPLIED TO PIPE LINES AND EQUIPMENT ONLY AFTER THEY HAVE BEEN INSPECTED, TESTED, CLEANED AND DRIED BY THE CONTRACTOR, AND SO APPROVED BY THE OWNERS FIELD REPRESENTATIVE. INSULATION SHALL REPRESENTATIVE. INSULATION SHALL BE DRY BEFORE AND DURING APPLICATION, FINISHING SHALL BE DONE AT OPERATING CONDITIONS.

THE INSULATION ON PIPING SHALL BE EXTENDED THROUGH ALL SLEEVES IN ORDER TO PRODUCE A CONTINUOUS APPLICATION. INSULATE ALL PIPING PASSING THROUGH SLEEVES.

BE 1" THICKNESS.

7. ALL DOMESTIC WATER PIPING INSULATION FOR PIPES 1 1/4" AND LARGER SHALL BE 1 1/2" THICKNESS.

ALL EXPOSED SANITARY, DOMESTIC WATER AND STOPS FOR PLUMBING FIXTURES INSULATIONS SHALL BE 1' MINERAL FIBER PREFORMED PIPE INSULATION TYPE 1.

INSULATION INSERTS SHALL BE INSTALLED AT ALL HANGERS. METAL SHIELDS SHALL BE APPLIED BETWEEN THE PIPING SUPPORTS AND INSULATION. SHIELDS SHALL BE FORMED TO FIT THE INSULATION AND SHALL EXTEND UP TO THE CENTER LINE OF THE PIPE. A FULL COAT OF INSULATING SEALER SHALL BE APPLIED TO THE SURFACE OF THE INSULATION IN CONTACT WITH THE METAL SHIELD.

PLUMBING FIXTURES

1. REFER TO PLUMBING FIXTURE, WATER HEATER SCHEDULES. EQUIPMENT SHALL BE THE NOTED PRODUCT.

CHLORINATION OF DOMESTIC WATER PIPING

BEFORE BEING PLACED IN SERVICE, ALL NEW WATER DISTRIBUTION LINES SHALL BE CHLORINATED. AFTER THE PRESSURE TEST, AND BEFORE CHLORINATION, ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED BY A THOROUGH FLUSHING THROUGH THE LINES, DISCHARGING THE FLOW FROM THE END OF THE LINES. THE SYSTEMS SHALL BE THOROUGHLY STERILIZED WITH A SOLUTION CONTAINING NOT LESS THAN 250 PARTS PER MILLION OF AVAILABLE CHLORINE. THE CHLORINATING MATERIALS SHALL BE EITHER LIQUID CHLORINE CONFORMING TO THE U.S. ARMY SPECIFICATION 4-1, OR CALCIUM HYPOCHLORITE OR CHLORINATED LIME CONFORMING TO FEDERAL SPECIFICATION O-C-114, AND SHALL BE INTRODUCED INTO THE SYSTEM IN A MANNER APPROVED BY THE ARCHITECT. THE STERILIZATION SOLUTION SHALL BE ALLOWED TO REMAIN IN THE SYSTEM FOR A PERIOD OF 24 HOURS, DURING WHICH TIME ALL VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES.

WHEN THE ABOVE PROCEDURE HAS BEEN COMPLETED TO THE SATISFACTION OF THE DEPARTMENT OF HEALTH, FLUSH OUT THE ENTIRE SYSTEM WITH FRESH WATER UNTIL AN ORTHOTOLIDIN TEST AT ALL OUTLETS SHOWS A CHLORINE RESIDUAL NOT IN EXCESS OF 0.5 PARTS PER MILLION AND UNTIL THE REPLACEMENT WATER THROUGHOUT THE LINES SHALL, UPON TEST, BOTH CHEMICALLY AND BACTERIOLOGICALLY, BE PROVED EQUAL TO THE WATER QUALITY OF THE CITY SUPPLY AND APPROVED BY THE MICHIGAN DEPARTMENT OF HEALTH.

IN THE PROCESS OF CHLORINATING NEWLY LAID WATER PIPE, ALL VALVES OR OTHER APPURTENANCES SHALL BE OPERATED WHILE PIPE LINES ARE FILLED WITH CHLORINE SOLUTION.

SHOULD THE INITIAL TREATMENT, IN THE OPINION OF DEPARTMENT OF HEALTH, PROVE INEFFECTIVE THE CHLORINATION PROCEDURE SHALL BE REPEATED UNTIL CONFORMED TESTS SHOWN THAT THE WATER SAMPLED FROM THE NEWLY LAID PIPE CONFORMS TO THE REQUIREMENTS OF THE ABOVE DEPARTMENT.

PIPE HANGERS AND SUPPORT

THE MECHANICAL CONTRACTOR SHALL PROVIDE PIPE HANGERS AND SUPPORTS AS REQUIRED. HANGERS SHALL BE GRINNELL, B-LINE, FEE-MASON OR MICHIGAN HANGER CO. C-CLAMP ATTACHMENT TO STRUCTURAL ELEMENTS IS NOT APPROVED.

HANGERS SHALL ADEQUATELY SUPPORT THE PIPING SYSTEM. THEY SHALL BE LOCATED NEAR OR AT CHANGES IN PIPING DIRECTION. WITHIN 10" OF EVERY FITTING AND CONCENTRATED LOAD THEY SHALL PROVIDE VERTICAL ADJUSTMENT TO MAINTAIN PITCH REQUIRED FOR EXPANSION AND CONTRACTION OF THE PIPING. HANGERS SHALL BE FASTENED TO BUILDING STEEL MEMBERS WHEREVER PRACTICABLE AND HUNG FROM TRUSS OR JOIST PANEL POINTS ONLY.

VALVES

1. BRONZE BALL VALVES

A. TWO-PIECE, FULL-PORT, BRONZE BALL VALVES WITH STAINLESS-STEEL

MANUFACTURERS, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, 3. PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

a. CONBRACO INDUSTRIES, INC., APOLLO VALVES. MILWAUKEE VALVE COMPANY.

DESCRIPTION:

c. NIBCO INC.

STANDARD: MSS SP-110. CWP RATING: 600 PSIG.

BODY DESIGN: TWO PIECE. BODY MATERIAL BRONZE.

ENDS: THREADED. SEATS, PTFE OR TFE.

STEM: STAINLESS STEEL

BALL: STAINLESS STEEL, VENTED. i. PORT: FULL.

MATERIALS TESTS

1. PIPING UNDER PRESSURE TEST SHALL NOT LOSE MORE THAN 2% OF TEST PRESSURE FOR A PERIOD OF 1 HOUR. TEST SHALL BE PERFORMED WITH AMBIENT TEMPERATURE APPROXIMATELY CONSTANT.

GRAVITY DRAIN PIPING SHALL BE TESTED AT MINIMUM 5 PSI AIR PRESSURE OR HYDROSTATIC WITH 10'-0' WATER COLUMN IN STACKS WITH NO LOSS OF WATER COLUMN BEING ACCEPTABLE. PRESSURIZED PIPING SHALL BE HYDROSTATICALLY TESTED AT 150 PSIG.

3. THE MECHANICAL CONTRACTOR SHALL REPAIR ALL DEFICIENCIES FOUND IN THE PIPING BY TESTING, THE MECHANICAL CONTRACTOR SHALL GUARANTEE THAT THE ENTIRE INSTALLATION OF THE PIPING AND PLUMBING SYSTEMS WILL DUCT INSULATION FUNCTION SATISFACTORILY AGAINST THE SPECIFIED SYSTEM PRESSURES. DEFECTS DUE TO IMPROPER MATERIALS, WORKMANSHIP, AND LEAKS SHALL BE CORRECTED WITHOUT ADDITIONAL COST TO THE OWNER. OTHER WORK AFFECTED AS A RESULT OF THE ABOVE MENTIONED DEFECTS SHALL ALSO BE MADE GOOD WITHOUT COST TO THE OWNER. THE ENTIRE SYSTEM SHALL BE LEFT IN PROPER OPERATING CONDITION, ACCEPTABLE TO THE ENGINEERS FIELD REPRESENTATIVE.

VENTILATION

DUCTWORK

1. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S 'HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE' BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.

TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, FIGURE 1-4, TRANSVERSE (GIRTH) JOINTS, FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S 'HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE."

C. LONGITUDINAL SEAMS, SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE," FIGURE 1-5, "LONGITUDINAL SEAMS - RECTANGULAR DUCTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION SELECT TYPES AND FABRICATE ACCORDING TO MECHANICAL IDENTIFICATION SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 2, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS. MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE."

E. ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, CHAPTER 2, FITTINGS AND OTHER CONSTRUCTION, FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S 'HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE."

SINGLE-WALL ROUND DUCTS AND FITTINGS

A. SINGLE WALL ROUND DUCTS AND FITTINGS MAY BE FACTORY FABRICATED OR SHOP FABRICATED.

B. PROVIDE ROUND DUCTS IN LENGTHS NOT LESS THAN 12 FEET. FABRICATE ROUND AND FLAT OVAL SPIRAL DUCTWORK OF MINIMUM 26 GAUGE SHEET METAL. NO LONGITUDINAL SEAM DUCTWORK ALLOWED

C. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, CHAPTER 3. 'ROUND, OVAL, AND FLEXIBLE DUCT,' BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED

D. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "TRANSVERSE JOINTS - ROUND DUCT," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S 'HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."

TRANSVERSE JOINTS IN DUCTS LARGER THAN 60 INCHES IN DIAMETER: FLANGED.

LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE, FIGURE 3-1, "SEAMS - ROUND DUCT AND FITTINGS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS -METAL AND FLEXIBLE."

1. FABRICATE ROUND DUCTS LARGER THAN 90 INCHES IN DIAMETER WITH BUTT-WELDED LONGITUDINAL SEAMS.

TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-4, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-5, 'CONICAL TEES,' FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

SHEET METAL MATERIALS

A. GENERAL MATERIAL REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.

GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653/A 653M.

GALVANIZED COATING DESIGNATION: G60.

2. FINISHES FOR SURFACES EXPOSED TO VIEW, MILL PHOSPHATIZED.

C. REINFORCEMENT SHAPES AND PLATES, ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS, BLACK AND GALVANIZED.

D. TIE RODS: GALVANIZED STEEL, 1/4-INCH MINIMUM DIAMETER FOR LENGTHS 36 INCHES OR LESS, 3/8-INCH MINIMUM DIAMETER FOR LENGTHS LONGER THAN 36 INCHES.

4. DUCT SEALING

A. ALL DUCTWORK AND PLENUMS WITH PRESSURE CLASS RATINGS SHALL BE CONSTRUCTED TO SEAL CLASS A.

DUCTWORK SHALL BE INSULATED AS FOLLOWS

A. ALL INSULATION MATERIALS SHALL BE CLASS A BY U.L. STANDARD FIBERGLASS INSULATION AND SHALL HAVE UL RATING NOT EXCEEDING 25 FLAME SPREAD, 50 FUEL CONTRIBUTED, AND 50 SMOKE DEVELOPED. ACCESSORIES SUCH AS ADHESIVE, MASTICS, CEMENTS, AND CLOTH FOR FITTINGS SHALL BE PERMANENTLY FIRE AND SMOKE RESISTANT. CHEMICALS USED FOR TREATING PAPER IN JACKET LAMINATES SHALL BE UNAFFECTED BY WATER OR HUMIDITY.

B. INSULATE FITTING AND JOINTS. DO NOT INSULATE FLEXIBLE CONNECTIONS. TERMINATE INSULATION NEATLY WITH PLASTIC MATERIAL.

C. INSTALL INSULATION MATERIALS AFTER DUCTWORK HAS BEEN INSPECTED, TESTED, CLEANED AND DRIED BY THE CONTRACTOR, AND SO APPROVED BY THE OWNERS FIELD REPRESENTATIVE. CLEAN SURFACES FOR ADHESIVES. INSTALL INSULATION MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL WITHOUT SAG ON UNDERSIDE OF DUCTWORK. USE ADHESIVE OR MECHANICAL FASTENERS WHERE NECESSARY TO PREVENT SAGGING. SEAL VAPOR BARRIER PENETRATIONS BY MECHANICAL FASTENERS WITH VAPOR BARRIER ADHESIVES.

D. FOR EXTERNALLY-INSULATED, ROUND, SQUARE OR RECTANGULAR DUCTWORK, INSULATION SHALL BE MINERAL FIBER BLANKET.

ALL SUPPLY DUCTWORK, RETURN DUCTWORK, OUTSIDE AIR DUCTWORK BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR AND EXHAUST AIR DUCTWORK BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR SHALL BE 1-1/2" THICK AND 1.5 LB/CU. FT.

1. EQUIPMENT LABELS

A. PLASTIC LABELS FOR EQUIPMENT

1. MATERIAL AND THICKNESS: MULTILAYER, MULTICOLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/16 INCH THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.

2. LETTER COLOR, WHITE.

3. BACKGROUND COLOR, BLACK.

MAXIMUM TEMPERATURE: ABLE TO WITHSTAND TEMPERATURES UP TO 160 DEG F.

MINIMUM LABEL SIZE: LENGTH AND WIDTH VARY FOR REQUIRED LABEL CONTENT. BUT NOT LESS THAN 2-1/2 BY 3/4 INCH.

MINIMUM LETTER SIZE: 1/4 INCH FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 24 INCHES, 1/2 INCH FOR VIEWING DISTANCES UP TO 72 INCHES, AND PROPORTIONATELY LARGER LETTERING FOR GREATER VIEWING DISTANCES. INCLUDE SECONDARY LETTERING TWO-THIRDS TO THREE-FOURTHS THE SIZE OF PRINCIPAL LETTERING.

7. FASTENERS: STAINLESS-STEEL SELF-TAPPING SCREWS.

8. ADHESIVE: CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE.

B. LABEL CONTENT: INCLUDE EQUIPMENT'S DRAWING DESIGNATION OR UNIQUE EQUIPMENT NUMBER, DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND SCHEDULES), PLUS THE SPECIFICATION SECTION NUMBER AND TITLE WHERE EQUIPMENT IS SPECIFIED.

A. PRETENSIONED PIPE LABELS: PRECOILED, SEMIRIGID PLASTIC FORMED TO

2. PIPE LABELS

COVER FULL CIRCUMFERENCE OF PIPE AND TO ATTACH TO PIPE WITHOUT FASTENERS OR ADHESIVE.

B. PIPE LABEL CONTENTS: INCLUDE IDENTIFICATION OF PIPING SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS, PIPE SIZE, AND AN ARROW INDICATING FLOW DIRECTION.

3. DUCT LABELS

A. MATERIAL AND THICKNESS: MULTILAYER, MULTICOLOR, PLASTIC LABELS FOR MECHANICAL ENGRAVING, 1/16 INCH THICK, AND HAVING PREDRILLED HOLES FOR ATTACHMENT HARDWARE.

B. ADHESIVE: CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE.

C. DUCT LABEL CONTENTS: INCLUDE IDENTIFICATION OF DUCT SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS. DUCT SIZE, AND AN ARROW INDICATING FLOW DIRECTION.

IN-LINE CENTRIFUGAL FANS

A. MANUFACTURERS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING.

ACME ENGINEERING & MFG. CORP. 2. CARNES COMPANY HVAC.

3. GREENHECK.

4. HARTZELL FAN, INC.

LOREN COOK COMPANY. 6. PENN VENTILATION.

DESCRIPTION: IN-LINE, DIRECT-DRIVEN CENTRIFUGAL FANS CONSISTING OF HOUSING, WHEEL, OUTLET GUIDE VANES, FAN SHAFT, BEARINGS, MOTOR AND DISCONNECT SWITCH, DRIVE ASSEMBLY, MOUNTING BRACKETS, AND ACCESSORIES.

C. HOUSING SPLIT, SPUN ALUMINUM WITH ALUMINUM STRAIGHTENING VANES, INLET AND OUTLET FLANGES, AND SUPPORT BRACKET ADAPTABLE TO FLOOR, SIDE WALL, OR CEILING MOUNTING.

D. DIRECT-DRIVEN UNITS: MOTOR MOUNTED IN AIRSTREAM, FACTORY WIRED

TO DISCONNECT SWITCH LOCATED ON OUTSIDE OF FAN HOUSING.

E. FAN WHEELS, ALUMINUM, AIRFOIL BLADES WELDED TO ALUMINUM HUB.

VARIABLE-SPEED CONTROLLER. SOLID-STATE CONTROL TO REDUCE SPEED FROM 100 TO LESS THAN 50 PERCENT.

G. VOLUME-CONTROL DAMPER: MANUALLY OPERATED WITH QUADRANT LOCK, LOCATED IN FAN OUTLET.

H. COMPANION FLANGES, FOR INLET AND OUTLET DUCT CONNECTIONS.

FAN GUARDS: 1/2- BY 1-INCH (13- BY 25-MM) MESH OF GALVANIZED STEEL IN REMOVABLE FRAME. PROVIDE GUARD FOR INLET OR OUTLET FOR UNITS NOT CONNECTED TO DUCTWORK.

J. MOTOR AND DRIVE COVER (BELT GUARD). EPOXY-COATED STEEL.

EXHAUST FANS (CEILING)

A. MANUFACTURERS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING

1. ACME ENGINEERING & MFG. CORP. 2. CARNES COMPANY HVAC.

3. GREENHECK.

4. HARTZELL FAN, INC. LOREN COOK COMPANY. 6. PENN VENTILATION.

B. GENERAL DESCRIPTION: DIRECT DRIVE DELUXE CEILING MOUNTED CENTRIFUGAL EXHAUST FANS CONSISTING OF WHEEL, MOTORS, HOUSING,

C. WHEEL.

1. FORWARD CURVED CENTRIFUGAL WHEEL

BACKDRAFT DAMPER, OUTLET, MOUNDING BRACKETS.

CONSTRUCTED OF CALCIUM CARBONATE FILLED POLYPROPYLENE.

3. STATICALLY AND DYNAMICALLY BALANCED IN ACCORDANCE TO AMCA STANDARD 204-05.

D. MOTORS:

1. AC INDUCTION MOTOR a. MOTOR ENCLOSURES, OPEN DRIP PROOF (ODP) - OPENING IN

THE FRAME BODY AND OR END BRACKETS.

MOTORS SHALL BE PERMANENTLY LUBRICATED SLEEVE BEARING TYPE TO MATCH WITH THE FAN LOAD AND FURNISHED AT THE SPECIFIC VOLTAGE AND PHASE.

c. MOTOR SHALL BE MOUNTED ON VIBRATION ISOLATORS AND

d. THERMAL OVERLOAD PROTECTION.

E. HOUSING

1. CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL

BE ACCESSIBLE FOR MAINTENANCE.

2. PROFILE AS LOW AS 7 INCHES.

F. PLASTIC BACKDRAFT DAMPER. 1. PREVENTS AIR FROM ENTERING BACK INTO

2. ELIMINATES RATTLING OR UNWANTED BACKDRAFTS.

THE BUILDING WHEN FAN IS OFF.



À R C H I T E C T S

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PROJECT NAME:

LE No. 23-0105

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SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S **BIDS & PERMITS**

CONSTRUCTION

OWNER REVIEW

EGAL REVIEW

and

PERMIT & BIDS

DRAWN BY: CHECKED BY: REVISIONS: SCHEMATIC DESIGN 11/07/23 DESIGN DEVELOPMENT 12/08/23 FINAL REVIEW

01/19/24

02/12/24

03/14/24

DATE: 19 SEPT. 2023

PROJECT NO .: 23-037 Mechanical

Plumbing Specifications

- PLASTIC DUCT COLLAR SHALL BE SIX OR FOUR INCHES IN DIAMETER TO ACCEPT A SIX OR FOUR INCH ROUND DUCT WORK.
- 2. SHALL INCLUDE A BACKDRAFT DAMPER.

H. MOUNTING BRACKETS.

1. FULLY ADJUSTABLE FOR MULTIPLE INSTALLATION CONDITIONS.

DAMPERS

A. MANUFACTURERS:

- AMERICAN WARMING AND VENTILATING
- MESTEK, INC.
- TAMCO
- 4. UNITED ENERTECH CORP.
- 5. RUSKIN
- 6. GREENHECK.
- B. DAMPERS, AMCA-RATED, PARALLEL BLADE PER THE DESIGN REQUIREMENTS, 0.108-INCH MINIMUM THICKNESS, GALVANIZED-STEEL OR 0.125-INCH MINIMUM THICK, EXTRUDED-ALUMINUM FRAMES WITH HOLES FOR DUCT MOUNTING, DAMPER BLADES SHALL NOT BE LESS THAN 0.064-INCH THICK GALVANIZED STEEL WITH MAXIMUM BLADE WIDTH OF 8-INCHES AND LENGTH OF 48-INCHES.
- SECURE BLADES TO 1/2-INCH DIAMETER, ZINC-PLATED AXLES USING ZINC-PLATED HARDWARE, WITH OIL-IMPREGNATED, SINTERED BRONZE BLADE BEARINGS, BLADE-LINKAGE HARDWARE OF ZINC-PLATED STEEL AND BRASS, ENDS SEALED AGAINST SPRING-STAINLESS-STEEL BLADE BEARINGS, AND THRUST BEARINGS AT EACH END OF EVERY BLADE.
- OPERATING TEMPERATURE RANGE: FROM MINUS 40- TO 200-DEGREES F.
- EDGE SEALS, LOW-LEAKAGE APPLICATIONS: USE INFLATABLE BLADE EDGING OR REPLACEABLE RUBBER BLADE SEALS.
- 4. JAMB SEALS: SPRING-LOADED, STAINLESS STEEL, ONLY.
- 5. LEAKAGE RATINGS OR DAMPERS SHALL BE LESS THAN 10 CFM PER SQ. FT. OF DAMPER AREA, AT DIFFERENTIAL PRESSURE OF 4-INCHES W.G. WHEN DAMPER IS HELD BY TORQUE OF 50 IN. X LBF., WHEN TESTED ACCORDING TO AMCA 500D.

ACTUATORS

- A. ELECTRONIC ACTUATORS: DIRECT-COUPLED TYPE DESIGNED FOR MINIMUM 60,000 FULL-STROKE CYCLES AT RATED TORQUE.
 - MANUFACTURERS.
 - a. BELIMO AIRCONTROLS (USA), INC.
 - DAMPERS: SIZE FOR RUNNING TORQUE CALCULATED AS FOLLOWS: a. PARALLEL-BLADE DAMPER WITH EDGE SEALS!
 - 7-INCH-LB. /SQ. FT. OF DAMPER CROSS-SECTIONAL AREA. b. OPPOSED-BLADE DAMPER WITH EDGE SEALS.
 - 5-INCH-LB. /SQ. FT. OF DAMPER CROSS-SECTIONAL AREA. c. PARALLEL-BLADE DAMPER WITHOUT EDGE SEALS.

 - 4-INCH-LB. /SQ. FT. OF DAMPER CROSS-SECTIONAL AREA.
 - d. OPPOSED-BLADE DAMPER WITHOUT EDGE SEALS. 3-INCH-LB. /SQ. FT. OF DAMPER CROSS-SECTIONAL AREA.
 - FACE VELOCITIES OF 1000- TO 2500-FPM: INCREASE RUNNING TORQUE BY 1.5. DAMPERS WITH 3- TO 4-INCHES W.G. OF PRESSURE DROP OR

e. DAMPERS WITH 2- TO 3-INCHES W.G. OF PRESSURE DROP OR

- FACE VELOCITIES OF 2500- TO 3000-FPM. INCREASE RUNNING TORQUE BY 2.0.
- 3. COUPLING, V-BOLT AND V-SHAPED, TOOTHED CRADLE.
- OVERLOAD PROTECTION: ELECTRONIC OVERLOAD OR DIGITAL ROTATION-SENSING CIRCUITRY.
- 5. FAIL-SAFE OPERATION: MECHANICAL, SPRING-RETURN MECHANISM. PROVIDE EXTERNAL, MANUAL, GEAR RELEASE ON ON-SPRING-RETURN ACTUATORS.
- 6. MANUAL OPERATION, PROVIDED FOR ALL VALVE ACTUATORS.
- 7. POWER REQUIREMENTS (TWO-POSITION SPRING RETURN): 24 V AC.
- TEMPERATURE RATING: MINUS 22- TO 122-DEGREES F.
- 9. RUN TIME: 95 SECONDS OPEN, 20 SECONDS CLOSED.

ELECTRIC DUCT HEATER

- A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING. 1. THERMOLEC
- B. CONSTRUCTION:
 - FRAME SHALL BE CORROSION-RESISTANT AND MADE OF GALVANIZED STEEL OF SUITABLE GAUGE AS REQUIRED BY CSA/UL.
- C. HEATER.
 - HEATING COILS SHALL BE OF HIGH GRADE NICKEL CHROMIUM ALLOY AND SHALL BE INSULATED BY FLOATING CERAMIC BUSHINGS 7. CONTROLS FROM THE GALVANIZED STEEL FRAME. COIL TERMINALS SHALL BE STAINLESS STEEL, INSULATED BY MEANS OF NON -ROTATING CERAMIC BUSHINGS.
- D. SAFETY CONTROLS.
- 1. HIGH TEMPERATURE AUTOMATIC RESET THERMAL CUTOUT THAT WILL RESET AUTOMATICALLY AFTER COOL OFF.
- 2. MANUAL RESET.

- E. STANDARD BUILT IN COMPONENTS.
- DUCT TEMPERATURE SENSOR.
- 2. BUILT IN ELECTRONIC CONTROLLER (SCR) ON/OFF COMPONENTS WILL NOT BE ACCEPTED.

F. AIR FLOW

- 1. BUILT IN TEMPERATURE SENSOR CONTROLS THE HEATER PROPORTIONALLY TO MAINTAIN THE PRE-SET AIR TEMPERATURE IN THE DUCT AT 70°F (ADJUSTABLE).
- REVERSIBLE MOUNTING AIR FLOW CAPABILITY.
- 3. ELECTRONIC AIR FLOW SENSOR AVAILABLE ON MODELS BELOW 100 CFM, AND A MAXIMUM KW'S OF 3KW ON 240/1 OR 2.5KW 208/1
- G. SIZE AND CAPACITY.
 - COLLAR SIZE, HEATER KW'S, VOLTS AND PHASE, SHALL BE AS PER ELECTRIC DUCT HEATER SCHEDULE.

H. INTERNAL WIRING:

- ALL INTERNAL WIRING SHALL TERMINATE ON CLEARLY IDENTIFIED TERMINAL BLOCKS.
- 2. A WIRING DIAGRAM SHALL BE INSTALLED ON THE CONTROL BOX
- 3. PRIOR TO SHIPPING, ALL UNITS SHALL WITHSTAND TESTS AS REQUIRED BY CSA/UL.

I. MOUNTING METHOD:

- UNIT MUST HAVE INLET/OUTLET COLLARS TO ACCOMMODATE JOB REQUIREMENT.
- THE UNIT SHALL HAVE HANGER BRACKETS DESIGNED TO BE USED WITH THREADED RODS (BY OTHERS).SPRING ISOLATORS OR OTHER MEANS, MAY BE ADDED TO THE RODS AS AN OPTION TO REDUCE VIBRATION (BY OTHERS).

ELECTRIC CABINET UNIT HEATER

- MANUFACTURERS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS,
- PROVIDE PRODUCTS BY ONE OF THE FOLLOWING. a. CHROMALOX, INC.
- b. INDEECO.
- c. MARKEL PRODUCTS COMPANY, TPI CORPORATION.
- d. MARLEY ENGINEERED PRODUCTS.
- e. QMARK, MARLEY ENGINEERED PRODUCTS. f. TRANE INC.

2. DESCRIPTION

- A. FACTORY-ASSEMBLED AND -TESTED UNIT COMPLYING WITH AHRI 440.
- B. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- C. COMPLY WITH UL 2021.

PERFORMANCE REQUIREMENTS

A. ASHRAE/IESNA 90.1 COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE/IESNA 90.1, SECTION 6 - "HEATING, VENTILATING, AND AIR-CONDITIONING."

4. CABINETS

- A. MATERIAL: STEEL WITH BAKED-ENAMEL FINISH WITH MANUFACTURER'S STANDARD PAINT, IN COLOR SELECTED BY ARCHITECT.
 - VERTICAL UNIT. EXPOSED FRONT PANELS: MINIMUM 16-GA. GALVANIZED SHEET STEEL, REMOVABLE PANELS WITH CHANNEL-FORMED EDGES SECURED WITH TAMPERPROOF CAM FASTENERS.
 - 2. RECESSED FLANGES: STEEL, FINISHED TO MATCH CABINET.
- 3. BASE: MINIMUM 18-GA. STEEL SUB-BASE, FINISHED TO MATCH CABINET, 6 INCHES HIGH WITH LEVELING BOLTS.

5. FILTERS

- A. MINIMUM ARRESTANCE: ACCORDING TO ASHRAE 52.1 AND A MINIMUM EFFICIENCY REPORTING VALUE (MERV) ACCORDING TO ASHRAE 52.2.
 - 1. PLEATED: 90 PERCENT ARRESTANCE AND MERV 7.

6. COILS

A. ELECTRIC-RESISTANCE HEATING COIL. NICKEL-CHROMIUM HEATING WIRE, FREE FROM EXPANSION NOISE AND HUM, EMBEDDED IN MAGNESIUM OXIDE REFRACTORY AND SEALED IN CORROSION-RESISTANT METALLIC SHEATH. TERMINATE ELEMENTS IN STAINLESS-STEEL MACHINE-STAKED TERMINALS SECURED WITH STAINLESS-STEEL HARDWARE. PROVIDE INTEGRAL CIRCUIT BREAKER FOR OVERCURRENT PROTECTION.

- A. FAN AND MOTOR BOARD, REMOVABLE.
- 1. FAN: FORWARD CURVED, DOUBLE WIDTH, CENTRIFUGAL, DIRECTLY CONNECTED TO MOTOR, THERMOPLASTIC OR PAINTED-STEEL WHEELS AND ALUMINUM, PAINTED-STEEL, OR GALVANIZED-STEEL FAN SCROLLS.
- 2. MOTOR, PERMANENTLY LUBRICATED, MULTISPEED, RESILIENTLY MOUNTED ON MOTOR BOARD. COMPLY WITH REQUIREMENTS IN DIVISION 20 SECTION "COMMON MOTOR REQUIREMENTS FOR FIRE SUPPRESSION, PLUMBING AND MECHANICAL EQUIPMENT."

- 3. WIRING TERMINATIONS: CONNECT MOTOR TO CHASSIS WIRING WITH PLUG CONNECTION.
- B. BASIC UNIT CONTROLS:
 - 1. CONTROL VOLTAGE TRANSFORMER.
- C. UNIT-MOUNTED THERMOSTAT WITH THE FOLLOWING FEATURES:
- 1. HEAT-OFF SWITCH.
- 2. FAN ON-AUTO SWITCH.
- MANUAL FAN-SPEED SWITCH. ADJUSTABLE DEADBAND.
- CONCEALED SET POINT.
- CONCEALED INDICATION. 7. DEG F (DEG C) INDICATION.
- D. ELECTRICAL CONNECTION: FACTORY-WIRED MOTORS AND CONTROLS FOR A SINGLE FIELD CONNECTION.

GRAVITY INTAKE/RELIEF HOODS

- A. MANUFACTURERS.
- ACME ENGINEERING & MFG. CORP. AEROVENT, A TWIN CITY FAN COMPANY.
- 3. CARNES.
- 4. GREENHECK.
- 5. JENCOFAN. LOREN COOK COMPANY.
- 7. PENN VENTILATION.
- B. FACTORY OR SHOP FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, FIGURES 5-6 AND
- C. MATERIALS, GALVANIZED-STEEL SHEET, MINIMUM 0.064-INCH THICK BASE AND 0.040-INCH THICK HOOD, SUITABLY REINFORCED.
- D. ROOF CURBS: GALVANIZED-STEEL SHEET, WITH MITERED AND WELDED CORNERS, 1-1/2-INCH THICK, RIGID FIBERGLASS INSULATION ADHERED TO INSIDE WALLS, AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO FIT ROOF OPENING AND VENTILATOR BASE.
- CONFIGURATION: SELF-FLASHING WITHOUT A CANT STRIP, WITH MOUNTING FLANGE.
- 2. OVERALL HEIGHT: 14 INCHES.

DIFFUSER AND GRILLES

A. DIFFUSERS AND GRILLES SHALL BE THE MANUFACTURER, MODEL AND MATERIAL LISTED IN EQUIPMENT SCHEDULES OR EQUIVALENT BY TITUS, TUTTLE AND BAILEY, KRUEGER OR APPROVED EQUAL.

TESTING AND BALANCING PROCEDURES

- PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS' AND THIS SECTION.
- CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES. AFTER TESTING AND BALANCING, CLOSE PROBE HOLES AND PATCH INSULATION WITH NEW MATERIALS IDENTICAL TO THOSE REMOVED, RESTORE VAPOR BARRIER AND FINISH ACCORDING TO THE INSULATION SPECIFICATIONS FOR THIS PROJECT.
- MARK EQUIPMENT SETTINGS WITH PAINT OR OTHER SUITABLE. PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER-CONTROL POSITIONS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS.
- 4. SET HVAC SYSTEM AIRFLOW WITHIN THE FOLLOWING TOLERANCES.
 - A. SUPPLY AIR OUTLETS: 0 TO PLUS 10 PERCENT.
- PROVIDE A FINAL REPORT USING NEBB'S REPORT FORMAT OR APPROVED EQUAL. INCLUDE DETAILED INFORMATION FOR EACH PIECE OF EQUIPMENT INSTALL BY THE PROJECT OR ADJUSTED BY THE PROJECT.
- ACCEPTABLE TAB FIRMS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS SELECT FROM ONE OF THE FOLLOWING TAB FIRMS.
- A. ABSOLUTE BALANCE CO.
- B. AIR FLOW TESTING INC. C. BARMATIC INSPECTING CO.

BE PROVIDED TO THE OWNER.

OF THE OWNER.

D. ENVIRO-AIRE-TOTAL BALANCE INC. E. INTERNATIONAL TEST AND BALANCE INC.

GUARANTEE

- THIS CONTRACTOR SHALL UNCONDITIONALLY GUARANTEE, IN WRITING, ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AND SHALL PROVIDE FREE SERVICE FOR REPAIR OF ALL EQUIPMENT INVOLVED IN THIS CONTRACT DURING THE GUARANTEE PERIOD. ALL EQUIPMENT WARRANTEES SHALL ALSO
- THE GUARANTEE SHALL INCLUDE RESTORATION TO ITS ORIGINAL CONDITION. AT NO COST TO THE OWNER, ALL ADJACENT WORK THAT MUST BE DISTURBED IN FULFILLING THE GUARANTEE ALL SUCH REPAIRS AND/OR REPLACEMENT SHALL BE MADE WITHOUT DELAY AND AT THE CONVENIENCE

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SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S

BIDS & PERMITS

REVISIONS:

SCHEMATIC DESIGN

DESIGN DEVELOPMENT

CONSTRUCTION DRAWN BY: CHECKED BY:

12/08/23 FINAL REVIEW OWNER REVIEW 01/19/24 02/12/24 EGAL REVIEW 03/14/24 PERMIT & BIDS

11/07/23

DATE: 19 SEPT. 2023

PROJECT NO .:

MARKO V. LAWRIN

23-037 Mechanical and Plumbing

Specifications

<u>MBOL</u>	DESCRIPTION	<u>SYMBOL</u>	DESCRIPTION
s	SINGLE POLE TOGGLE SWITCH	d GFI	DUPLEX RECEPTACLE-GROUND FAULT
S 2	TWO POLE TOGGLE SWITCH	••GFI	INTERRUPTER DUPLEX RECEPTACLE MOUNTED 42° AFF OR 6
S 3	3 WAY TOGGLE SWITCH	₩ GFI	ABOVE COUNTER TOP. (UNLESS NOTED OTHERWISE) WITH GROUND FAULT INTERRUP
S 4	4 WAY TOGGLE SWITCH	M USB	COMBINATION 2A USB / 20A RECEPTACLE
SK	KEY OPERATED SWITCH	0	PASS&SEYMOUR TR5361USB OR EQUAL
Sd Sp	DIMMER SWITCH	& °	CEILING MOUNTED DUPLEX RECEPTACLE
S⊦	PILOT SWITCH LOW VOLTAGE, MOMENTARY CONTACT.	F	QUAD FLOOR MOUNTED RECEPTACLE
J L	ON-OFF LIGHTING CONTROL STATION	a F	DUPLEX FLOOR MOUNTED RECEPTACLE
S L3	LOW VOLTAGE, 3 BUTTON PRESET LIGHTING CONTROL STATION	⊗	SPECIAL RECEPTACLE-NEMA CONFIGURATION AS NOTED
S L4	LOW VOLTAGE, 4 BUTTON PRESET LIGHTING CONTROL STATION		QUAD RECEPTACLE/LOW VOLTAGE SYSTEM FLOOR BOX
S LD	LOW VOLTAGE, ON-OFF WITH DIMMING LIGHTING CONTROL STATION	₩ ₽	DUPLEX RECEPTACLE/LOW VOLTAGE SYSTEM FLOOR BOX
Sv	LINE VOLTAGE, ON-OFF WITH VACANCY SENSOR LIGHTING CONTROL STATION -	$oldsymbol{\Theta}_{ extsf{PT}}$	POKE THRU FITTING PROVIDING 120 VOLT POWER, SEE SCHEDULE
S vd	MANUAL ON, AUTO OFF LINE VOLTAGE, ON-OFF WITH DIMMING AND	\mathbf{S}_{PT}	POKE THRU FITTING PROVIDING TECHNOLOGY CABLING, SEE SCHEDULE.
	VACANCY SENSOR LIGHTING CONTROL STATION - MANUAL ON, AUTO OFF	${f Q}_{\scriptscriptstyle{PT}}$	POKE THRU FITTING PROVIDING 120 VOLT POWER AND TECHNOLOGY CABLING, SEE SCHEDULE
S M	LINE VOLTAGE, ON-OFF WITH OCCUPANCY SENSOR LIGHTING CONTROL STATION - AUTO ON, AUTO OFF	~ B _{PT}	POKE THRU FITTING PROVIDING 120 VOLT POWER AND TECHNOLOGY CABLING TO ELECTRIFIED FURNITURE, SEE SCHEDULE
S TC	LOW VOLTAGE COLOR TOUCH SCREEN MULTI CHANNEL LIGHTING CONTROL STATION	M	VERTICAL RISER FOR SURFACE RACEWAY
◇	OCCUPANCY SENSOR, SURFACE OR PENDANT MOUNT AS REQUIRED TO ACCOMMODATE		SURFACE RACEWAY
	CEILING / EXPOSED CONSTRUCTION CONDITIONS		RUO RUOT
�	DAYLIGHT SENSOR, SURFACE OR PENDANT MOUNT AS REQUIRED TO ACCOMMODATE	4	PANELBOARD
	CEILING / EXPOSED CONSTRUCTION CONDITIONS		DISTRIBUTION PANEL
©	PHOTOCELL CONTROLLER		MAIN DISTRIBUTION PANEL/MAIN
LC	LIGHTING CONTROLLER		SWITCHBOARD MOTOR CONTROL CENTER
EM	UL924 EMERGENCY LIGHTING LOAD TRANSFER RELAY		TRANSFORMER
	LIGHT FIXTURE, TYPE AS INDICATED	<i>§</i>	SINGLE PHASE MOTOR
N EM	EMERGENCY LIGHT FIXTURE, TYPE AS INDICATED	Ø	THREE PHASE MOTOR
	LINEAR LIGHT FIXTURE, TYPE AS INDICATED		MANUAL MOTOR STARTER
	DOWNLIGHT LIGHT FIXTURE, TYPE AS INDICATED	⊿ P ⊠	MANUAL MOTOR STARTER WITH PILOT LIGHT
Ю	WALL MOUNTED LIGHT FIXTURE, TYPE AS INDICATED	(전) 전	THREE PHASE MOTOR STARTER
8	EXIT LIGHT, (SHADED AREA INDICATED FACE OF	땁	THREE PHASE COMBINATION MOTOR STARTS NON-FUSED DISCONNECT SWITCH
١.٨	FIXTURE), TYPE AS INDICATED COMBINATION EXIT LIGHT AND EMERGENCY BATTERY	D D	FUSED DISCONNECT SWITCH
B	UNIT, (SHADED AREA INDICATED FACE OF FIXTURE), TYPE AS INDICATED	•	PUSH BUTTON
	EMERGENCY LIGHTING BATTERY UNIT, TYPE AS INDICATED	J 0	JUNCTION BOX
∇	SINGLE HEAD EXTERIOR REMOTE EMERGENCY LIGHT, TYPE AS INDICATED	○	HARD WIRE POWER CONNECTION HARD WIRE CONNECTION AT FLOOR BOX
D	(2) HEAD EXTERIOR REMOTE EMERGENCY LIGHT, TYPE AS INDICATED	2	CIRCUIT BREAKER
Ф	DUPLEX RECEPTACLE	7	SWITCH
8	QUAD RECEPTACLE		AUTOMATIC OR MANUAL TRANSFER SWITCH
⊕	DUPLEX RECEPTACLE MOUNTED 42" AFF OR 6" ABOVE COUNTER TOP. (UNLESS NOTED	<u>©</u>	ENGINE GENERATOR
	OTHERWISE)		FUSE
		ши m	TRANSFORMER

<u>SYMBOL</u>

DESCRIPTION

NODE

GROUND

SPEAKER

MICROPHONE

VOLUME CONTROL

MOTION DETECTOR

SECURITY CAMERA

SMOKE DETECTOR

HEAT DETECTOR

OTHERWISE NOTED)

OTHERWISE NOTED)

MAGNETIC DOOR RELEASE

FIRE ALARM CONTROL PANEL

FIRE ALARM ANNUNCIATOR PANEL

SINGLE GANG OUTLET BOX FOR LOW VOLTAGE SYSTEMS. STUB RACEWAY UP INTO ACCESSIBLE

CEILING SPACE. PROVIDE BUSHING. PROVIDE

SINGLE GANG OUTLET BOX FOR LOW VOLTAGE

UNLESS NOTED OTHERWISE. STUB UP RACEWAY

BUSHING. PROVIDE BLANK COVERPLATE. WIRING

SINGLE GANG OUTLETBOX FOR LOW VOLTAGE

SYSTEMS FLOOR MOUNTED. STUB UP RACEWAY INTO ACCESSIBLE CEILING SPACE. PROVIDE

BUSHING. PROVIDE BLANK COVERPLATE. WIRING

POWER AND LOW VOLTAGE RACEWAY TO

SERVE VIDEO DISPLAY. REFER TO

TELECOMMUNICATIONS BACKBOARD

ALL "SPECIAL SYSTEMS" (TYPICALLY TELEPHONE, TV, AND DATA) WIRING AND DEVICES BY OTHERS,

UNLESS NOTED ON PLANS OR SPECIFICATIONS. E.C. TO PROVIDE BOXES, RACEWAYS, BACKBOARDS,

COORDINATE EXACT REQUIREMENTS OF RACEWAY AND BOX SIZES WITH LOW VOLTAGE CONTRACTOR.

TECHNOLOGY DRAWINGS

INTO ACCESSIBLE CEILING SPACE. PROVIDE

BLANK COVERPLATE. WIRING BY OTHERS.

SYSTEMS MOUNTED 42" AFF OR 6" ABOVE COUNTERTOP (COORDINATE WITH MILLWORK)

TAMPER SWITCH

FLOW SWITCH

BY OTHERS.

BY OTHERS.

AND COVERPLATES (PER SPECIFICATIONS IF APPLICABLE).

PRIOR TO INSTALLATION.

SPECIAL SYSTEMS

FAAP

DUCT SMOKE DETECTOR

CARD READER

TIME CLOCK

DOOR CONTACT

KEY PAD

UTILITY METER

CURRENT TRANSFORMER

TRANSFORMER GROUND

SPEAKER - WALL MOUNTED

TRANSIENT VOLTAGE SURGE SUPPRESSION

DOUBLE FACE SPEAKER - WALL MOUNTED

SINGLE FACE CLOCK - CEILING MOUNTED

SINGLE FACE CLOCK - WALL MOUNTED

DOUBLE FACE CLOCK - WALL MOUNTED

MANUAL FIRE ALARM PULL STATION

MOTORIZED SMOKE DAMPER, NORMALLY

LOSS OF 120V POWER

CARBON DIOXIDE DETECTOR

NO AIR FLOW IS PRESENT

LOCATION IN AREA SERVED BY DUCT.

PROVIDE RESET SWITCH IN ACCESSIBLE

FIRE ALARM STROBE ONLY. WALL MOUNT,

XX - CANDELA RATING (15 CANDELA UNLESS

FIRE ALARM SPEAKER/STROBE. WALL MOUNT, XX - CANDELA RATING (15 CANDELA UNLESS

FIRE ALARM STROBE ONLY. CEILING OR

PENDANT MOUNT, XX - CANDELA RATING

(15 CANDELA UNLESS OTHERWISE NOTED)

FIRE ALARM SPEAKER/STROBE. CEILING OR

PENDANT MOUNT, XX - CANDELA RATING (15 CANDELA UNLESS OTHERWISE NOTED)

CLOSED, HELD OPEN WITH POWER. PROVIDE

120V POWER TO DAMPER. LABEL DAMPER WITH

PANEL AND CIRCUIT FROM WHICH IT IS BEING SERVED. PROVIDE DUCT SMOKE DETECTOR,

LOCATE TO SAMPLE DUCT AIR, COORDINATE

DUCT SMOKE DETECTOR IN ALARM

MOUNTING WITH MECHANICAL TRADES. DAMPER TO CLOSE UPON THE FOLLOWING CONDITIONS:

(MOUNT 7'-6" AFF TO CENTER)

ELECTRICAL ABBREVIATION LIST

<u>ABBREVATION</u>	DESCRIPTION	<u>ABBREVATION</u>	<u>DESCRIPTION</u>	<u>ABBREVATION</u>	<u>DESCRIPTION</u>
A	AMPHERE	FLA	FULL LOAD AMPS	NC	NORMALLY CLOSED
AFF	ABOVE FINISH FLOOR	F	FUSE	NF	NON-FUSIBLE
AFG	ABOVE FINISH GRADE			NIC	NOT IN CONTRACT
AHU	AIR HANDLING UNIT	GFI	GROUND FAULT INTERRUPTER	NL	NIGHT LIGHT
AIC	AMPS INTERRUPTING CAPACITY	GRD	GROUND	NO	NORMALLY OPEN
ATS	AUTOMATIC TRANSFER SWITCH			NTS	NOT TO SCALE
		HOA	HAND-OFF-AUTO		
BKR	BREAKER	HP	HORSEPOWER	RECEPT.	RECEPTACLE
BPS	BOLTED PRESSURE SWITCH	HZ	HERTZ	RP	RECEPTACLE PANEL
				RTU	ROOF TOP UNIT
CB	CIRCUIT BREAKER	IG	ISOLATED GROUND		
CIR/CKT	CIRCUIT			SD	SMOKE DETECTOR
CLG	CEILING	JB	JUNCTION BOX	SPEC	SPECIFICATION
CP	CIRCULATION PUMP				
CUH	CABINET UNIT HEATER	KW	KILOWATT	TELCOM	TELECOMMUNICATIONS
		KWH	KILOWATT - HOURS	TYP	TYPICAL
DED	DEDICATED	KVA	KILO VOLT-AMPERES		
DISC	DISCONNECT			UH	UNIT HEATER
DP	DISTRIBUTION PANEL	LP	LIGHTING PANEL	U.O.N.	UNLESS OTHERWISE NOTE
DWG	DRAWING	LO	LOCK-ON		
				WP	WEATHERPROOF
EBU	EMERGENCY BATTERY UNIT	MCA	MINIMUM CIRCUIT AMPACITY	WG	WIRE GUARD
EF	EXHAUST FAN	MCB	MAIN CIRCUIT BREAKER		
EM	EMERGENCY	MCC	MOTOR CONTROL CENTER	Т#	TRANSFORMER
EM/NL	EMERGENCY/NIGHT LIGHT	MDP	MAIN DISTRIBUTION PANEL	(-)	
EUH	ELECTRIC UNIT HEATER	MLO	MAIN LUGS ONLY	(E)	EXISTING
EWC	ELECTRIC WATER COOLER	MSB	MAIN SWITCHBOARD	(5)	
EWH	ELECTRIC WATER HEATER	MTD	MOUNTED	(R)	RELOCATED
		MUA	MAKE-UP AIR UNIT	(N)	NEW

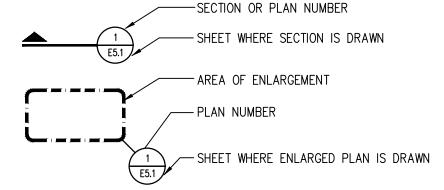
STANDARD MOUNTING HEIGHTS

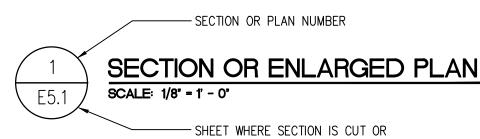
CONVENIENCE AND SPECIAL PURPOSE RECEPTACLE OUTLETS AND LOW VOLTAGE SYSTEMS OUTLETS NOT OTHERWISE SPECIFIED	18" AFF TO CENTER OF BOX
CONVENIENCE AND SPECIAL PURPOSE RECEPTACLE OUTLETS AND LOW VOLTAGE SYSTEMS OUTLETS NOT OTHERWISE SPECIFIED IN CMU WALLS	24" AFF TO TOP OF BOX
LIGHT SWITCHES, MOTOR CONTROL DEVICES AND FIRE ALARM PULL STATIONS NOT OTHERWISE SPECIFIED	48" AFF TO CENTER OF BOX
FIRE ALARM HORNS, SPEAKERS, STROBES	80" AFF OR 6" BELOW CEILING, WHICHEVER IS LESS
CLOCKS AND COMBINATION DEVICES NOT OTHERWISE SPECIFIED	96" AFF OR 6" BELOW CEILING, WHICHEVER IS LESS
GFI RECEPTACLES IN TOILET ROOMS AND JANITOR CLOSETS NOT OTHERWISE SPECIFIED	42" AFF TO CENTER OF BOX
	6'-6" AFF TO TOP OF ENCLOSURE

** COORDINATE EXACT MOUNTING HEIGHTS WITH ARCHITECT/MILLWORK PRIOR TO ROUGH-IN. **

STANDARD METHODS OF NOTATION

$\langle 1 \rangle$	CONSTRUCTION NOTE NUMBER
1	DEMOLITION NOTE NUMBER
\propto	SPECIAL EQUIPMENT DESIGNATION
$\langle \times \rangle$	FEEDER & CIRCUIT SIZING DESIGNATION





211	////_

HEAVY LINE WEIGHT INDICATES NEW WORK LIGHT LINE WEIGHT INDICATES EXISTING EQUIPMENT OR REFERENCED INFORMATION DASHED LINES INDICATE CONDUIT

ENLARGED PLAN IS REFERENCED

ROUTED BELOW SLAB OR GRADE

HATCH MARKS INDICATE EQUIPMENT OR MATERIALS TO BE DISCONNECTED AND REMOVED.

NOTE: ALL SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

ELECTRICAL DRAWING INDEX

SHEET NO. SHEET TITLE

ELECTRICAL COVER SHEET ELECTRICAL SITE PLAN

ELECTRICAL FLOOR PLANS ELECTRICAL ENLARGED PLANS

ELECTRICAL ONE-LINE DIAGRAM AND PANEL SCHEDULES ELECTRICAL SPECIFICATIONS

LIGHTING FIXTURE SCHEDULE TYPE LAMP/SOURCE/WATTAGE DESCRIPTION VOLTS | MANUFACTURER(S) WALL MOUNTING FULL SHARP CUT OFF 11.5" W X 9" H, TRAPEZOID SHAPED LED LIGHT FIXTURE. SINGLE PIECE DIE 1. LITHONIA WDGE2 LED-P4-CAST ALUMINUM HOUSING. ENCLOSED AND GASKET, ZINC-35 WATT LED SYSTEM 40K-80CRI-VW-MVOLT-SRM INFUSED SUPER DURABLE TGIC THERMOSET POWDER COAT 120V 2. RAYON T630LED-G2 4500 LUMEN, 4000K FINISH, ARCHITECT TO SELECT FINISH COLOR, P4 70 CRI (MINIMUM) PERFORMANCE PACKAGE. VISUAL COMFORT WIDE LIGHT 3. RAYON T633LED SERIES DISTRIBUTION. STANDARD LOW TEMPERATURE DRIVER, 10 KV SURGE PROTECTION DEVICE. UL LISTED FOR WET LOCATION. 4 FOOT VAPOR TIGHT LED STRIP LIGHT FIXTURE, SURFACE LITHONIA CSVT-L48-34 WATT LED SYSTEM MOUNTED. ROUND FROSTED POLYCARBONATE LENS. LIGHT 4000LM-MVOLT-40K-80CRI 4000 LUMEN, 4000K GRAY POLYCARBONATE HOUSING, GASKETTED, STAINLESS 120V 2. COOPER METALUX APVTS 80 CRI (MINIMUM) STEEL LATCHES, 0-10V DIMMING DRIVER, 2.5 KV SURGE PROTECTION. UL LISTED FOR WET LOCATION. SELF CONTAINED EMERGENCY LIGHTING UNIT FOR WALL MOUNTING, THERMOPLASTIC BODY, TWO LED HEADS, . LITHONIA EU2C LED ADJUSTABLE, AUTOMATIC BROWNOUT PROTECTION, A.C. "ON" 2. COOPER SURE-LITES INDICATOR, PUSH TO TEST BUTTON, MAINTENANCE-FREE 2 WATT LED SYSTEM AP2SQLED SERIES NICKEL CADMIUM BATTERY PROVIDING 90 MINUTES OF 3. LIGHTALARMS EMERGENCY POWER. 120 VOLT INPUT, WHITE FINISH, UL LISTED. FIELD COORDINATE EXACT MOUNTING HEIGHT.

NOTES

- 1 ALL LED LIGHT FIXTURES SHALL BE PROVIDED WITH INTEGRAL SURGE SUPPRESSION. WHERE PROTECTION IS NOT INTEGRAL OR IN ACCORDANCE WITH LISTED REQUIREMENTS, UTILIZE A SEPARATE SURGE SUPPRESSOR SPECIFICALLY INSTALLED AND WIRED TO PROTECT THE LED FIXTURE OR FIXTURE CIRCUIT, WITH THE FOLLOWING MINIMUMS: FOR INPUT VOLTAGE REQUIRED, 2KV MINIMUM SURGE FOR INDOOR FIXTURES AND 10KV SURGE FOR OUTDOOR FIXTURES, CONFORMANCE WITH JEEE C62.41.2 C-HIGH, CATEGORY C3, CSA, UL AND RoHS.
- 2 ALL LED LIGHT FIXTURES, LIGHT FIXTURE POWER SUPPLIES, ETC. SHALL BE PROVIDED WITH MINIMUM 5 YEAR WARRANTY THAT BEGINS THE DAY OF OWNER ACCEPTANCE. THIS REQUIREMENT MAY NOT BE ALTERED BY THE MANUFACTURER OR BIDDER.
- 3 ALL LIGHT FIXTURES AND LIGHT FIXTURE COMPONENTS SHALL BE INSTALLED AND CONNECTED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

ÁRCHITECTS

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LE No. 23-0105

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SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S

BIDS & PERMITS CONSTRUCTION DRAWN BY:

CHECKED BY:

REVISIONS: SCHEMATIC DESIGN

FINAL REVIEW OWNER REVIEW 01/19/24 02/12/24 EGAL REVIEW PERMIT & BIDS

DATE: 19 SEPT. 2023

PROJECT NO .: 23-037

KEVIN C.

RETTICH

ENGINEER

DESIGN DEVELOPMENT

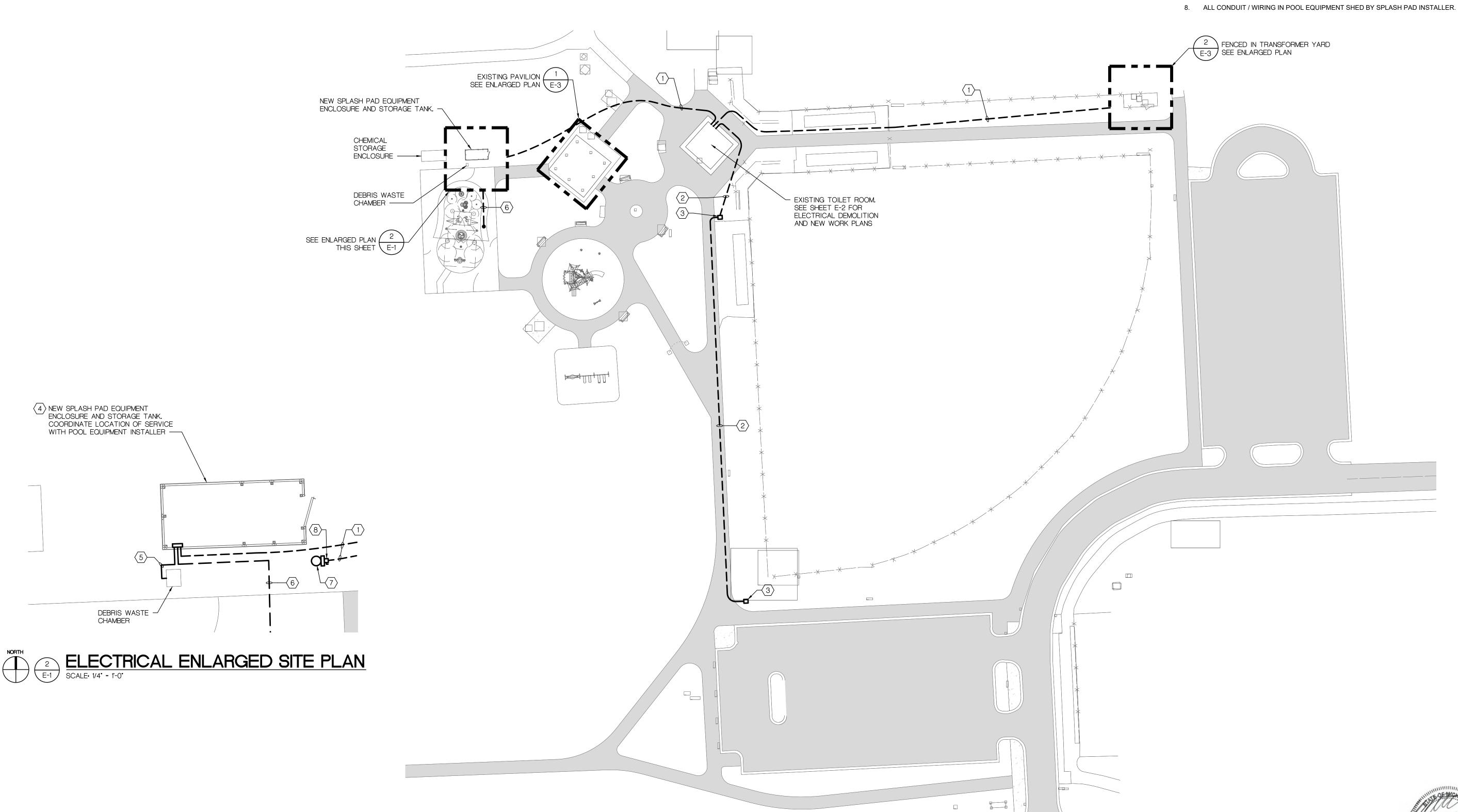
DRAWING NAME:

Electrical Cover Sheet

- 1. SEE ONE LINE FOR FEEDER / BRANCH CIRCUIT SIZES.
- 2. NEW (2) 2"PVC FOR FUTURE SOLAR.
- 3. NEW 24" X 12" X 24" DEEP CLOSED BOTTOM HANDHOLE.
- 4. PROVIDE GROUND ROD AND GROUND STRUCTURE AND PANEL.
- 5. 2 #12 & 1 #12G 3/4"PVC FROM MAIN CONTROL PANEL TO DRAIN TO WASTE VALVE. COORDINATE LOCATION WITH PIT INSTALLER.
- 6. 2 #14 & 1 #14G 3/4"PVC FROM MAIN CONTROL PANEL TO AQUAVATOR BOLLARD. COORDINATE LOCATION WITH PAD INSTALLER.
- 7. DUPLEX 3HP GRINDER PUMPS AND CONTROL PANEL. RUN CONDUIT BACK TO DISCONNECT SWITCH IN TOILETS.
- MOUNT 30A DISCONNECT SWITCH ON STANTION NEXT TO CONTROL

SITE GENERAL NOTES:

- SURFACE MOUNTED CONDUIT ON THE NEW BUILDING EXTERIOR IS NOT ALLOWED AT ANY LOCATION UNDER ANY CIRCUMSTANCES.
- 2. INSTALL WARNING TAPE ABOVE ALL SITE CONDUITS EXCEPT THOSE INSTALLED WITH A DIRECTIONAL BORE.
- 3. PROVIDE A PULL ROPE IN ALL EMPTY CONDUIT.
- 4. ALL SITE CONDUITS SHALL BE LOCATED MINIMUM 42" BELOW GRADE.
- 5. CONDUIT ROUTING SHOWN ON PLAN IS FOR INTENT ONLY. FIELD DETERMINE BEST LOCATION TO SUIT FIELD CONDITIONS.
- 6. COORDINATE THE EXACT LOCATION OF ALL SITE CONDUIT WITH CIVIL TRADES PRIOR TO INSTALLATION.
- USE EXTREME CAUTION WHEN WORKING IN AREAS WITH EXISTING UTILITIES. REFER TO ARCHITECTURAL AND / OR CIVIL SITE DRAWINGS FOR SITE INTERFERENCES, UTILITIES, ETC. REVIEW OWNERS RECORD DOCUMENTS FOR ADDITIONAL INFORMATION. HAND DIG IN AREAS WITH OTHER UTILITIES TO AVOID INTERFERENCE, USE BELOW GRADE ELECTRONIC DETECTION METHODS TO LOCATE INTERFERENCES.



RETTICH ENGINEER No. 34542



WHEN USING THIS DRAWING - PLOT OR PRINT FULL SIZE TO ENSURE CORRECT SCALE. NOTE REDUCED SIZE DRAWINGS ARE NOT TO SCALE

E. ELLSWORTH RD

WHEN USING THIS DRAWING - PLOT OR PRINT FULL SIZE TO ENSURE CORRECT SCALE. NOTE REDUCED SIZE DRAWINGS ARE NOT TO SCALE

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LE No. 23-0105 PROJECT NAME:

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DRAWN BY: CHECKED BY: REVISIONS:

SCHEMATIC DESIGN
DESIGN DEVELOPMENT FINAL REVIEW EGAL REVIEW PERMIT & BIDS

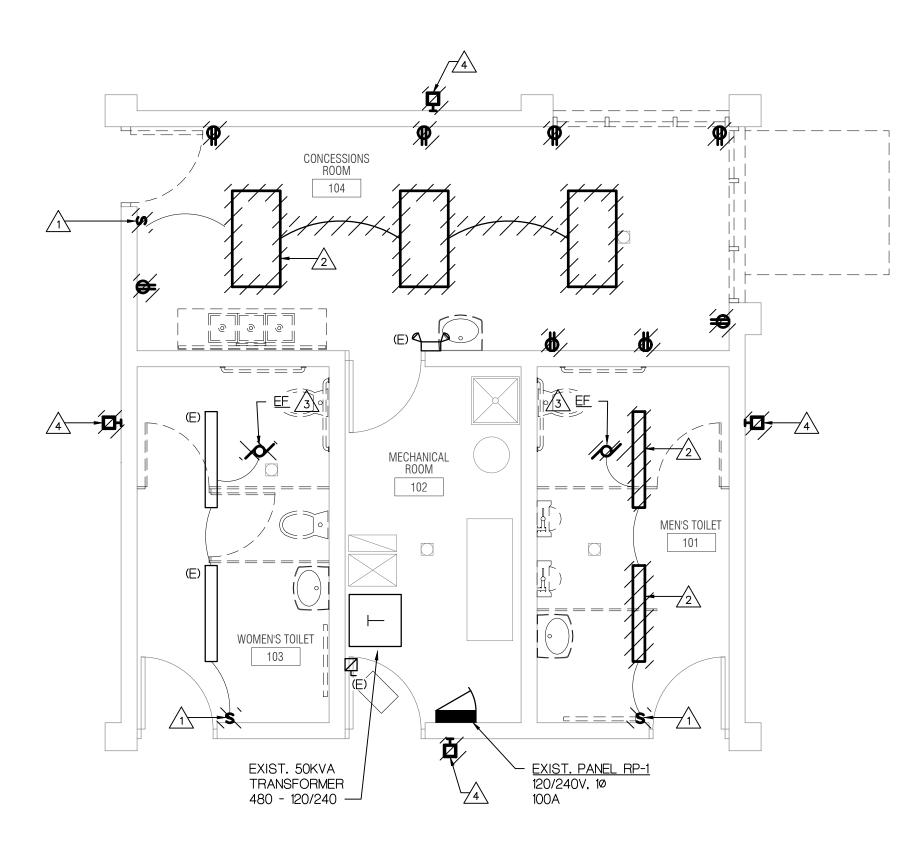
CONSTRUCTION

19 SEPT. 2023

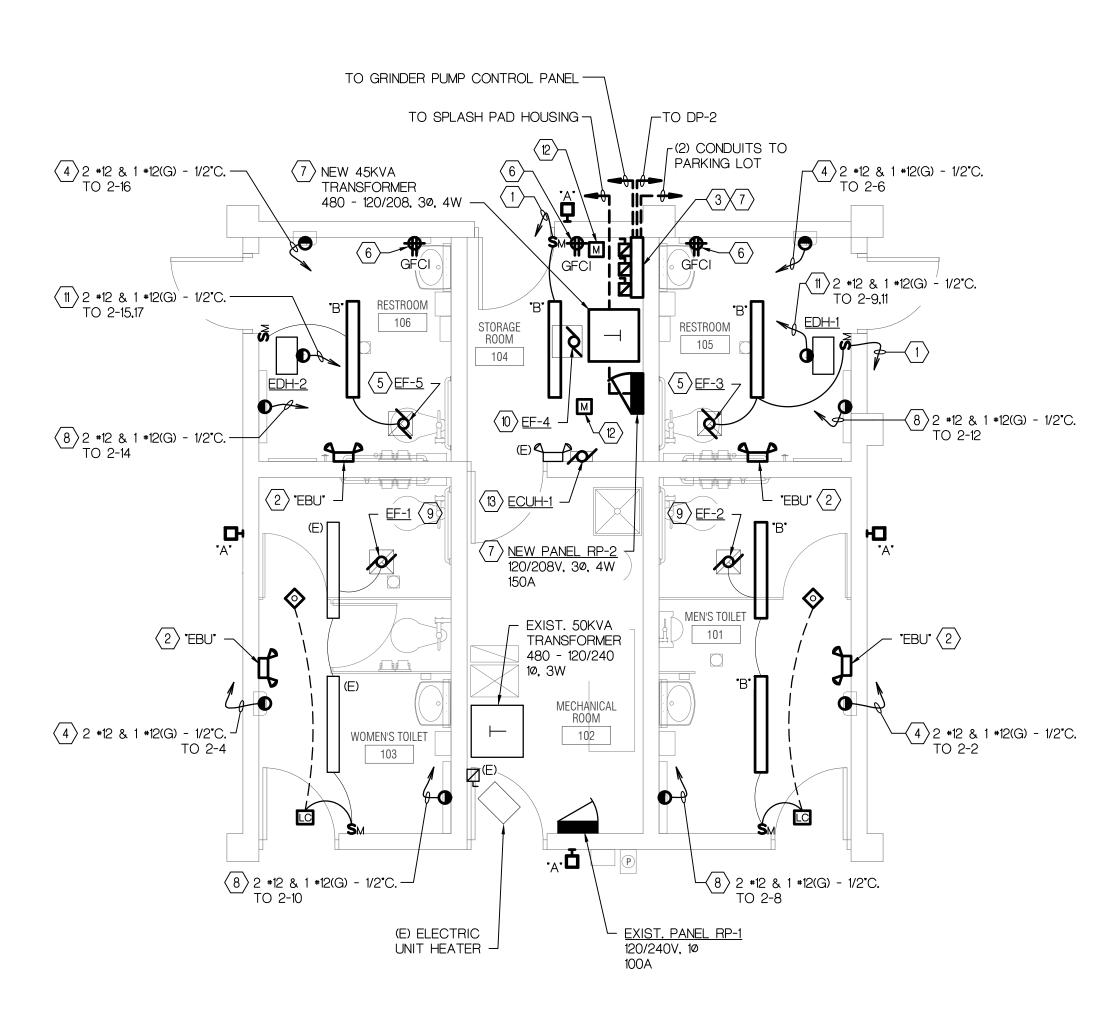
PROJECT NO.:

23-037 DRAWING NAME:

Electrical Site Plan









△ DEMOLITION KEY NOTES:

- REPLACE EXISTING TOGGLE SWITCH WITH OCCUPANCY MOTION SENSOR.
- 2. REPLACE EXISTING FLUORESCENT LIGHT FIXTURES WITH TYPE "B".
- DISCONNECT CIRCUIT TO EXHAUST FAN. REUSE BRANCH CIRCUIT TO SERVE NEW EXHAUST FAN. SEE NEW WORK PLAN.
- 4. REPLACE EXISTING WALL PACK FIXTURES WITH TYPE

(X) ELECTRICAL KEY NOTES:

- 1. CIRCUIT TO EXISTING CIRCUIT FROM OLD LIGHT.
- 2. CIRCUIT EBU'S TO NON-SWITCHED LEG OF LIGHT BRANCH CIRCUIT.
- 3. 2.5 FOOT LENGTH X 4" X 4" WIREWAY BELOW FUSIBLE SWITCHES.
- 4. NEW HAND DRYER.
- NEW EXHAUST FAN. CIRCUIT TO OCCUPANCY SENSOR LIGHT SWITCH.
- 6. CONNECT TO CIRCUIT PREVIOUSLY SERVING REMOVED RECEPTACLES.
- 7. DO NOT INSTALL ELECTRICAL EQUIPMENT UNDER MECHANICAL PIPING OR DUCTWORK.COORDINATE WITH MECHANICAL TRADES FOR WATER PIPING LOCATIONS PRIOR TO ROUGH IN.
- 8. NEW ADJUSTABLE HEIGHT CHANGING STATION.
- NEW EXHAUST FAN. RECONNECT TO BRANCH CIRCUIT PREVIOUSLY SERVING REMOVED EXHAUST FAN.
- 10. NEW EXHAUST FAN. CIRCUIT THRU 120V THERMOSTAT.
- 11. SEE CONTROL DIAGRAM SHEET E-4.
- 12. CIRCUIT MOTORIZED DAMPERS TO 2-13.
- 13. NEW ELECTRIC CABINET UNIT HEATER (ECUH-1), 1KW, 120V. CIRCUIT TO 2-18.

DEMOLITION GENERAL NOTES:

- 1. REFER TO SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
- 2. ELECTRICAL EQUIPMENT, DEVICES, BOXES, ETC. INDICATED ON ELECTRICAL DEMOLITION DRAWINGS ARE NOT INTENDED TO SHOW COMPLETE DEMOLITION REQUIREMENTS OR ALL ITEMS TO BE DEMOLISHED BUT IS INTENDED TO SHOW MAJOR COMPONENTS ONLY. THE ELECTRICAL DEMOLITION WORK SHALL BE COMPLETE IN ALL DETAILS AND REQUIREMENTS AND READY FOR THE INSTALLATION OF NEW SYSTEMS AND EQUIPMENT.
- 3. ALL EXISTING ELECTRICAL EQUIPMENT, PANELS, LIGHTING FIXTURES, DEVICES, CONDUIT, WIRING, BOXES, ETC. SHOWN ON DEMOLITION PLAN SHALL BE DEMOLISHED UNLESS OTHERWISE INDICATED TO REMAIN.
- 4. ALL ELECTRICAL DEVICES, LIGHTING, MECHANICAL EQUIPMENT SERVICES, ETC. DOWNSTREAM OF DEVICES INTENDED TO BE DEMOLISHED OR REVISED SHALL REMAIN OPERATIONAL. PROVIDE ALL BRANCH CIRCUIT WIRING REVISIONS AS REQUIRED TO MAINTAIN OPERATION OF ALL DEVICES, LIGHTING, ETC. NOT INTENDED TO BE REVISED.
- 5. REFER TO ARCHITECTURAL DRAWINGS FOR THE SCOPE OF CEILING SYSTEM REVISIONS. INCLUDE ALL ELECTRICAL WORK REQUIRED TO ACCOMMODATE CEILING SYSTEM REVISIONS INCLUDING RE-SUPPORTING OR RELOCATING CONDUIT, BOXES, WIRING, ETC. REQUIRED TO REMAIN. INCLUDE ALL CONDUIT, BOX AND WIRING REVISIONS REQUIRED.
- 6. WHEN REMOVING A DEVICE, OUTLET, RECEPTACLE, LIGHT FIXTURE, ETC. WIRING SHALL BE REMOVED COMPLETE. NO UNUSED WIRING SHALL REMAIN. INCLUDE FIELD INVESTIGATIONS AND WIRE TRACING IN ORDER TO DETERMINE THE USE AND FUNCTION OF ALL EXISTING WIRING.
- 7. ALL RACEWAYS, BOXES, CONDUIT, WIREMOLD, ETC. SHALL BE REMOVED COMPLETE EXCEPT THAT CONDUIT WHICH IS CONCEALED WITHIN EXISTING BUILDING CONSTRUCTION MAY BE ABANDONED IN PLACE ONCE WIRING IS REMOVED.
- 8. REMOVED EQUIPMENT, CONDUIT, WIRE, RECEPTACLES, TOGGLE SWITCHES, LIGHTING FIXTURES, ETC., SHALL NOT BE REUSED UNLESS OTHERWISE NOTED, SHALL BECOME THE PROPERTY OF THIS CONTRACTOR AND HE/SHE SHALL REMOVE SAME FROM THE PREMISES. REMOVED EQUIPMENT AND MATERIALS SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL ENVIRONMENTAL REQUIREMENTS.
- 9. ALL WALL PENETRATIONS, CONDUITS OR CONDUIT SLEEVES NO LONGER REQUIRED, REGARDLESS OF THE SYSTEM SERVED, SHALL BE REMOVED COMPLETE WITH THE PENETRATION PATCHED TO MAINTAIN THE ORIGINAL FIRE RATING OR CONSTRUCTION OF THE WALL.
- 10. ALL CIRCUITS MADE AVAILABLE THROUGH DEMOLITION AND NOT REUSED SHALL BE INDICATED AS SPARE ON THE PANEL DIRECTORY.

ELECTRICAL GENERAL NOTES:

- 1. REFER TO SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
 - 2. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF LIGHT FIXTURES.
- 3. ALL LIGHT FIXTURES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE AND IN ACCORDANCE WITH NEC AND LOCAL REQUIREMENTS.
- 4. SURFACE MOUNTED CONDUIT ON THE BUILDING EXTERIOR IS NOT ALLOWED.
- 5. SERVE EMERGENCY AND EXIT LIGHTS FROM CONNECTION ON LINE SIDE OF LIGHT SWITCH OR LIGHTING CONTROL POWER PACK CONTROLLING AREA LIGHTING. EMERGENCY AND EXIT LIGHTING TO AUTOMATICALLY ILLUMINATE FROM INTEGRAL BATTERY ON LOSS OF NORMAL POWER.
- 6. ALL EMERGENCY BRANCH CIRCUIT WIRING SHALL BE INSTALLED IN SEPARATE CONDUIT FROM THE NORMAL BRANCH CIRCUIT WIRING.
- 7. INCLUDE DAYLIGHT HARVESTING WHERE INDICATED ON PLAN OR WHERE REQUIRED FOR CODE CONFORMANCE.
- 8. REFER TO ARCHITECTURAL DRAWINGS FOR THE SCOPE OF CEILING SYSTEM REVISIONS. INCLUDE ALL ELECTRICAL WORK REQUIRED TO ACCOMMODATE CEILING SYSTEM REVISIONS INCLUDING RE-SUPPORTING OR RELOCATING CONDUIT, BOXES, WIRING, ETC. REQUIRED TO REMAIN. INCLUDE ALL CONDUIT, BOX AND WIRING REVISIONS REQUIRED.
- 9. ALL CONDUIT AND WIRING SHALL BE CONCEALED IN ALL FINISHED AREAS.
 WHERE CONCEALING CONDUIT IS NOT FEASIBLE BECAUSE OF EXISTING
 MASONRY CONSTRUCTION, A FINISHED SURFACE RACEWAY SHALL BE USED.
- 10. BRANCH CIRCUIT WIRING SHALL BE IN STRICT ACCORDANCE WITH NEC ARTICLE 310 AND TABLE 310.15 ADJUSTMENT FACTORS FOR MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY. INSTALL A MAXIMUM OF THREE CIRCUITS IN A SINGLE CONDUIT. DE-RATE THE AMPACITY PER THE NEC WHERE THE NUMBER OF CONDUCTORS EXCEEDS 3.
- 11. AS-BUILT DRAWINGS SHALL INDICATE ACTUAL LIGHTING CIRCUITS.
- 12. PROVIDE ELECTRIC SERVICE TO ALL MECHANICAL EQUIPMENT. REFER TO MECHANICAL DRAWINGS FOR EQUIPMENT QUANTITIES AND LOCATIONS. INCLUDE ALL MOTORIZED AND AIR HANDLING EQUIPMENT.
- 13. ALL OUTLETS WITHIN 6'-0" OF SINKS, DRINKING FOUNTAINS, AND OTHER WATER SOURCES SHALL BE GFCI TYPE RECEPTACLES.
- 14. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHT AND LOCATION OF VARIOUS RECEPTACLES AND OUTLETS ABOVE COUNTERS, AT EQUIPMENT, ETC.
- 15. ALL 120 VOLT BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR.
- 16. ALL CONDUIT SERVING WIRING 120 VOLTS OR GREATER SHALL HAVE A GROUND WIRE.
- 17. USING AN INDELIBLE MARKER, NEATLY LABEL BY HAND, IN ALL UNFINISHED AREAS, JUNCTION BOXES TO INDICATE THE PANEL AND CIRCUIT(S) WHICH THE BOX SERVES.
- 18. METAL CLAD CABLE, COMPLETE WITH CONTINUOUS GROUND WIRE, MAY BE USED IN ACCORDANCE WITH NEC REQUIREMENTS AND ELECTRICAL SPECIFICATIONS. EXPOSED METAL CLAD CABLE SHALL NOT BE IN LENGTHS EXCEEDING SIX FEET. METAL CLAD CABLE SHALL NOT BE USED FOR HOMERUNS TO PANELS. METAL CLAD CABLE SHALL NOT BE USED IN MASONRY CONSTRUCTION.
- 19. ALL 120 VOLT BRANCH CIRCUITS SHALL BE 2#12 + 1#12 GROUND ¾" C SERVED FROM A 20 AMP SINGLE POLE CIRCUIT BREAKER UNLESS OTHERWISE REQUIRED.
- 20. ALL 120 VOLT CIRCUITS GREATER THAN 90 FEET FROM CIRCUIT BREAKER TO LAST LOAD ON CIRCUIT SHALL BE WITH #10 AWG WIRE.
- 21. BRANCH CIRCUIT WIRING SHALL BE IN STRICT ACCORDANCE WITH NEC ARTICLE 310 AND TABLE 310.15 ADJUSTMENT FACTORS FOR MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY. INSTALL A MAXIMUM OF THREE CIRCUITS IN A SINGLE CONDUIT. DERATE THE AMPACITY PER THE NEC WHERE THE NUMBER OF CONDUCTORS EXCEEDS 3.
- 22. CIRCUIT NUMBERS INDICATED ON PLAN ASSOCIATED WITH EXISTING PANELBOARDS MAY NOT REFLECT THE ACTUAL CIRCUIT BREAKER POSITION IN THE PANEL BUT ARE SHOWN TO INDICATE LOADS TO BE GROUPED ON THE SAME CIRCUIT. USE EXISTING SPARE CIRCUITS AS WELL AS CIRCUITS MADE AVAILABLE THRU DEMOLITION TO SERVE NEW CIRCUITING REQUIREMENTS. INDICATE ACTUAL CIRCUIT NUMBERS ON AS BUILT DRAWINGS.
- 23. PROVIDE TYPED PANELBOARD DIRECTORIES FOR ALL NEW CIRCUIT BREAKER PANELBOARDS, NEW REPLACEMENT PANELBOARDS AND EXISTING PANELBOARDS WHERE REVISIONS ARE MADE. PROVIDE ALL FIELD SURVEYING AND CIRCUIT TRACING REQUIRED TO DETERMINE LOAD SERVED FROM EACH PANEL BREAKER. ALL PANEL BOARD DIRECTORIES TO BE DATED. ON DIRECTORIES INDICATE NOT ONLY USED BREAKERS BUT ALSO SPARE BREAKERS. ALL SPARE BREAKERS SHALL BE LEFT IN THE OFF POSITION. WITH PROJECT CLOSE OUT DOCUMENTS, PROVIDE THE FOLLOWING:
 - a. A BINDER WITH A HARD COPY OF ALL PANELBOARD DIRECTORIES. EACH TO BE DATED. INCLUDE THE NAME, COMPANY AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR THE PANELBOARD DIRECTORIES.
 - b. A FLASH DRIVE WITH BOTH PDF FILES AND WORD FILES OF ALL PANELBOARD DIRECTORIES. EACH TO BE DATED. INCLUDE THE NAME, COMPANY AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR THE PANELBOARD DIRECTORIES.

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NTENNIAL PAR ROOMS and P

SCHEMATIC DESIGN
DESIGN DEVELOPMENT
CONSTRUCTION DOC.'S

BIDS & PERMITS

CONSTRUCTION

DRAWN BY: VS
CHECKED BY: KR
REVISIONS:

 SCHEMATIC DESIGN
 10/26/23

 DESIGN DEVELOPMENT
 11/07/23

 FINAL REVIEW
 12/08/23

 OWNER REVIEW
 01/19/24

 EGAL REVIEW
 02/12/24

 PERMIT & BIDS
 03/14/24

19 SEPT. 2023

PROJECT NO.:

23-037
VING NAME:

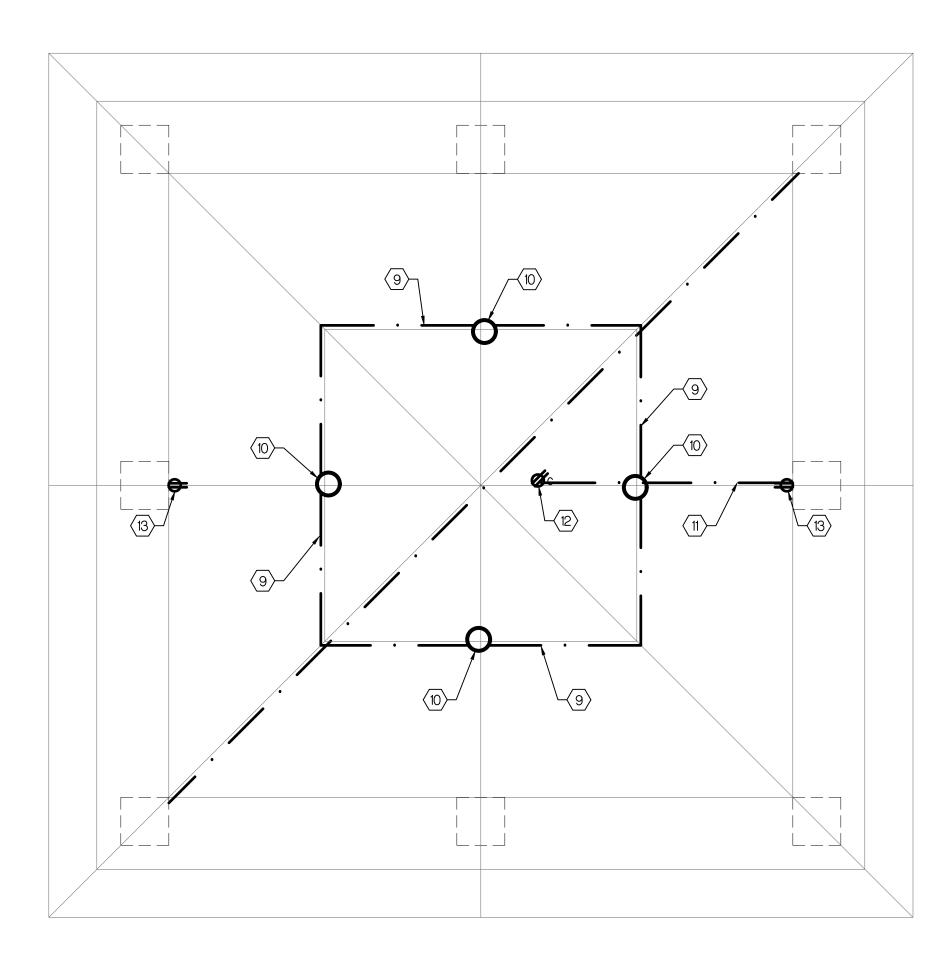
Electrical Floor Plans

SHEET NO.:

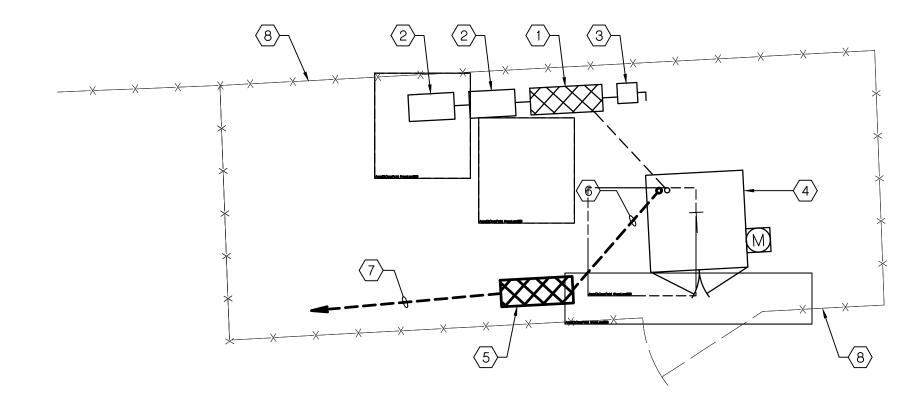
KEVIN C.

RETTICH

SHEET NO.:







ELECTRICAL ENLARGED

TRANSFORMER YARD PLAN

SCALE: 1/4' - 1'-0'

(X) ENLARGED KEY NOTES:

- 1. EXISTING DP-1.
- 2. EXISTING MUSCO CONTROLLERS.
- 3. EXISTING 30A DISCONNECT SWITCH / TRANSFORMER.
- 4. EXISTING DTE TRANSFORMER WITH METER.
- 5. NEW DP-2. MOUNT ON UNISTRUT RACK SIMILAR TO EXISTING.
- 6. RUN CONDUIT 2" PVC UP INTO EXISTING TRANSFORMER PAD.
- 7. UNDERGROUND FEEDER TO TOILET BUILDING / WIREWAY.
- 8. FENCED AREA (TYP).
- 9. EXISTING ELECTRICAL LIGHTING CONDUIT TO BE REMOVED. CONTRACTOR TO CAP AND DISCONNECT EXISTING LIGHTING CIRCUIT AND TO PREP FOR NEW CONSTRUCTION. TYPICAL AT ALL EXISTING LIGHTING LOCATIONS.
- 10. REMOVE EXISTING ELECTRICAL LIGHTING CEILING PACK LIGHT FIXTURES. CONTRACTOR TO CAP AND DISCONNECT ELECTRICAL BRANCH CIRCUIT AS REQUIRED FOR NEW CONSTRUCTION. TYPICAL AT ALL LOCATIONS.
- 11. EXISTING POWER CONDUIT TO BE REMOVED, CONTRACTOR TO RELOCATE EXISTING BRANCH CIRCUIT AND PREP FOR NEW
- 12. REMOVE EXISTING CEILING POWER OUTLET JUNCTION BOX.
- 13. REPLACE THE RECEPTACLE COVER AND RECEPTACLE WITH NEW GFCI RECEPTACLE AND METAL IN USE W.P. COVER.

DEMOLITION GENERAL NOTES:

- 1. REFER TO SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
- 2. ELECTRICAL EQUIPMENT, DEVICES, BOXES, ETC. INDICATED ON ELECTRICAL DEMOLITION DRAWINGS ARE NOT INTENDED TO SHOW COMPLETE DEMOLITION REQUIREMENTS OR ALL ITEMS TO BE DEMOLISHED BUT IS INTENDED TO SHOW MAJOR COMPONENTS ONLY. THE ELECTRICAL DEMOLITION WORK SHALL BE COMPLETE IN ALL DETAILS AND REQUIREMENTS AND READY FOR THE INSTALLATION OF NEW SYSTEMS AND EQUIPMENT.
 - ALL EXISTING ELECTRICAL EQUIPMENT, PANELS, LIGHTING FIXTURES, DEVICES, CONDUIT, WIRING, BOXES, ETC. SHOWN ON DEMOLITION PLAN SHALL BE DEMOLISHED UNLESS OTHERWISE INDICATED TO REMAIN.
- 4. ALL ELECTRICAL DEVICES, LIGHTING, MECHANICAL EQUIPMENT SERVICES, ETC. DOWNSTREAM OF DEVICES INTENDED TO BE DEMOLISHED OR REVISED SHALL REMAIN OPERATIONAL. PROVIDE ALL BRANCH CIRCUIT WIRING REVISIONS AS REQUIRED TO MAINTAIN OPERATION OF ALL DEVICES, LIGHTING, ETC. NOT INTENDED TO BE REVISED.
- 5. REFER TO ARCHITECTURAL DRAWINGS FOR THE SCOPE OF CEILING SYSTEM REVISIONS. INCLUDE ALL ELECTRICAL WORK REQUIRED TO ACCOMMODATE CEILING SYSTEM REVISIONS INCLUDING RE-SUPPORTING OR RELOCATING CONDUIT, BOXES, WIRING, ETC. REQUIRED TO REMAIN. INCLUDE ALL CONDUIT, BOX AND WIRING REVISIONS REQUIRED.
- 6. WHEN REMOVING A DEVICE, OUTLET, RECEPTACLE, LIGHT FIXTURE, ETC. WIRING SHALL BE REMOVED COMPLETE. NO UNUSED WIRING SHALL REMAIN. INCLUDE FIELD INVESTIGATIONS AND WIRE TRACING IN ORDER TO DETERMINE THE USE AND FUNCTION OF ALL EXISTING WIRING.
- 7. ALL RACEWAYS, BOXES, CONDUIT, WIREMOLD, ETC. SHALL BE REMOVED COMPLETE EXCEPT THAT CONDUIT WHICH IS CONCEALED WITHIN EXISTING BUILDING CONSTRUCTION MAY BE ABANDONED IN PLACE ONCE WIRING IS REMOVED.
- 8. REMOVED EQUIPMENT, CONDUIT, WIRE, RECEPTACLES, TOGGLE SWITCHES, LIGHTING FIXTURES, ETC., SHALL NOT BE REUSED UNLESS OTHERWISE NOTED, SHALL BECOME THE PROPERTY OF THIS CONTRACTOR AND HE/SHE SHALL REMOVE SAME FROM THE PREMISES. REMOVED EQUIPMENT AND MATERIALS SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL ENVIRONMENTAL REQUIREMENTS.
- 9. ALL WALL PENETRATIONS, CONDUITS OR CONDUIT SLEEVES NO LONGER REQUIRED, REGARDLESS OF THE SYSTEM SERVED, SHALL BE REMOVED COMPLETE WITH THE PENETRATION PATCHED TO MAINTAIN THE ORIGINAL FIRE RATING OR CONSTRUCTION OF THE WALL.
- 10. ALL CIRCUITS MADE AVAILABLE THROUGH DEMOLITION AND NOT REUSED SHALL BE INDICATED AS SPARE ON THE PANEL DIRECTORY.

ELECTRICAL GENERAL NOTES:

- REFER TO SPECIFICATIONS FOR COMPLETE REQUIREMENTS.
- 2. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF LIGHT FIXTURES.
- 3. ALL LIGHT FIXTURES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE AND IN ACCORDANCE WITH NEC AND LOCAL REQUIREMENTS.
- 4. SURFACE MOUNTED CONDUIT ON THE BUILDING EXTERIOR IS NOT ALLOWED.
- 5. SERVE EMERGENCY AND EXIT LIGHTS FROM CONNECTION ON LINE SIDE OF LIGHT SWITCH OR LIGHTING CONTROL POWER PACK CONTROLLING AREA LIGHTING. EMERGENCY AND EXIT LIGHTING TO AUTOMATICALLY ILLUMINATE FROM INTEGRAL BATTERY ON LOSS OF NORMAL POWER.
- 6. ALL EMERGENCY BRANCH CIRCUIT WIRING SHALL BE INSTALLED IN SEPARATE CONDUIT FROM THE NORMAL BRANCH CIRCUIT WIRING.
- 7. INCLUDE DAYLIGHT HARVESTING WHERE INDICATED ON PLAN OR WHERE REQUIRED FOR CODE CONFORMANCE.
- 8. REFER TO ARCHITECTURAL DRAWINGS FOR THE SCOPE OF CEILING SYSTEM REVISIONS. INCLUDE ALL ELECTRICAL WORK REQUIRED TO ACCOMMODATE CEILING SYSTEM REVISIONS INCLUDING RE-SUPPORTING OR RELOCATING CONDUIT, BOXES, WIRING, ETC. REQUIRED TO REMAIN. INCLUDE ALL CONDUIT, BOX AND WIRING REVISIONS REQUIRED.
- 9. ALL CONDUIT AND WIRING SHALL BE CONCEALED IN ALL FINISHED AREAS.
 WHERE CONCEALING CONDUIT IS NOT FEASIBLE BECAUSE OF EXISTING
 MASONRY CONSTRUCTION, A FINISHED SURFACE RACEWAY SHALL BE USED.
- 10. BRANCH CIRCUIT WIRING SHALL BE IN STRICT ACCORDANCE WITH NEC ARTICLE 310 AND TABLE 310.15 ADJUSTMENT FACTORS FOR MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY. INSTALL A MAXIMUM OF THREE CIRCUITS IN A SINGLE CONDUIT. DE-RATE THE AMPACITY PER THE NEC WHERE THE NUMBER OF CONDUCTORS EXCEEDS 3.
- 11. AS-BUILT DRAWINGS SHALL INDICATE ACTUAL LIGHTING CIRCUITS.
- 12. PROVIDE ELECTRIC SERVICE TO ALL MECHANICAL EQUIPMENT. REFER TO MECHANICAL DRAWINGS FOR EQUIPMENT QUANTITIES AND LOCATIONS. INCLUDE ALL MOTORIZED AND AIR HANDLING EQUIPMENT.
- 13. ALL OUTLETS WITHIN 6'-0" OF SINKS, DRINKING FOUNTAINS, AND OTHER WATER SOURCES SHALL BE GFCI TYPE RECEPTACLES.
- 14. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHT AND LOCATION OF VARIOUS RECEPTACLES AND OUTLETS ABOVE COUNTERS, AT EQUIPMENT, ETC.
- 15. ALL 120 VOLT BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR.
- 16. ALL CONDUIT SERVING WIRING 120 VOLTS OR GREATER SHALL HAVE A GROUND WIRE.
- 17. USING AN INDELIBLE MARKER, NEATLY LABEL BY HAND, IN ALL UNFINISHED AREAS, JUNCTION BOXES TO INDICATE THE PANEL AND CIRCUIT(S) WHICH THE BOX SERVES.
- 18. METAL CLAD CABLE, COMPLETE WITH CONTINUOUS GROUND WIRE, MAY BE USED IN ACCORDANCE WITH NEC REQUIREMENTS AND ELECTRICAL SPECIFICATIONS. EXPOSED METAL CLAD CABLE SHALL NOT BE IN LENGTHS EXCEEDING SIX FEET. METAL CLAD CABLE SHALL NOT BE USED FOR HOMERUNS TO PANELS. METAL CLAD CABLE SHALL NOT BE USED IN MASONRY CONSTRUCTION.
- 19. ALL 120 VOLT BRANCH CIRCUITS SHALL BE 2#12 + 1#12 GROUND ¾" C SERVED FROM A 20 AMP SINGLE POLE CIRCUIT BREAKER UNLESS OTHERWISE REQUIRED.
- 20. ALL 120 VOLT CIRCUITS GREATER THAN 90 FEET FROM CIRCUIT BREAKER TO LAST LOAD ON CIRCUIT SHALL BE WITH #10 AWG WIRE.
- 21. BRANCH CIRCUIT WIRING SHALL BE IN STRICT ACCORDANCE WITH NEC ARTICLE 310 AND TABLE 310.15 ADJUSTMENT FACTORS FOR MORE THAN 3 CURRENT CARRYING CONDUCTORS IN A RACEWAY. INSTALL A MAXIMUM OF THREE CIRCUITS IN A SINGLE CONDUIT. DERATE THE AMPACITY PER THE NEC WHERE THE NUMBER OF CONDUCTORS EXCEEDS 3.
- 22. CIRCUIT NUMBERS INDICATED ON PLAN ASSOCIATED WITH EXISTING PANELBOARDS MAY NOT REFLECT THE ACTUAL CIRCUIT BREAKER POSITION IN THE PANEL BUT ARE SHOWN TO INDICATE LOADS TO BE GROUPED ON THE SAME CIRCUIT. USE EXISTING SPARE CIRCUITS AS WELL AS CIRCUITS MADE AVAILABLE THRU DEMOLITION TO SERVE NEW CIRCUITING REQUIREMENTS. INDICATE ACTUAL CIRCUIT NUMBERS ON AS BUILT DRAWINGS.
- 23. PROVIDE TYPED PANELBOARD DIRECTORIES FOR ALL NEW CIRCUIT BREAKER PANELBOARDS, NEW REPLACEMENT PANELBOARDS AND EXISTING PANELBOARDS WHERE REVISIONS ARE MADE. PROVIDE ALL FIELD SURVEYING AND CIRCUIT TRACING REQUIRED TO DETERMINE LOAD SERVED FROM EACH PANEL BREAKER. ALL PANEL BOARD DIRECTORIES TO BE DATED. ON DIRECTORIES INDICATE NOT ONLY USED BREAKERS BUT ALSO SPARE BREAKERS. ALL SPARE BREAKERS SHALL BE LEFT IN THE OFF POSITION. WITH PROJECT CLOSE OUT DOCUMENTS, PROVIDE THE FOLLOWING:
 - a. A BINDER WITH A HARD COPY OF ALL PANELBOARD DIRECTORIES. EACH TO BE DATED. INCLUDE THE NAME, COMPANY AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR THE PANELBOARD DIRECTORIES.
 - b. A FLASH DRIVE WITH BOTH PDF FILES AND WORD FILES OF ALL PANELBOARD DIRECTORIES. EACH TO BE DATED. INCLUDE THE NAME, COMPANY AND PHONE NUMBER OF THE INDIVIDUAL RESPONSIBLE FOR THE PANELBOARD DIRECTORIES.

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Statement of Intellectual Property

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SCHEMATIC DESIGN

DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S

BIDS & PERMITS

DRAWN BY: VS
CHECKED BY: KR
REVISIONS:

 REVISIONS:

 SCHEMATIC DESIGN
 10/26/23

 DESIGN DEVELOPMENT
 11/07/23

 FINAL REVIEW
 12/08/23

 OWNER REVIEW
 01/19/24

 EGAL REVIEW
 02/12/24

 PERMIT & BIDS
 03/14/24

DATE: 19 SEPT. 2023

PROJECT NO.:

CONSTRUCTION

23-037

DRAWING NAME:

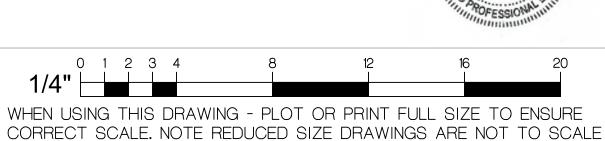
Electrical

Enlarged

Enlarged Plans

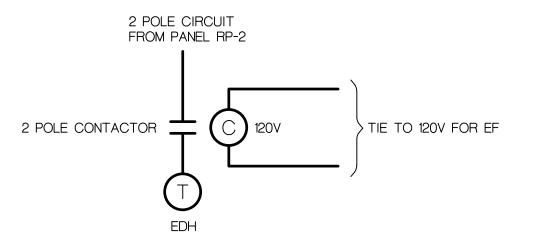
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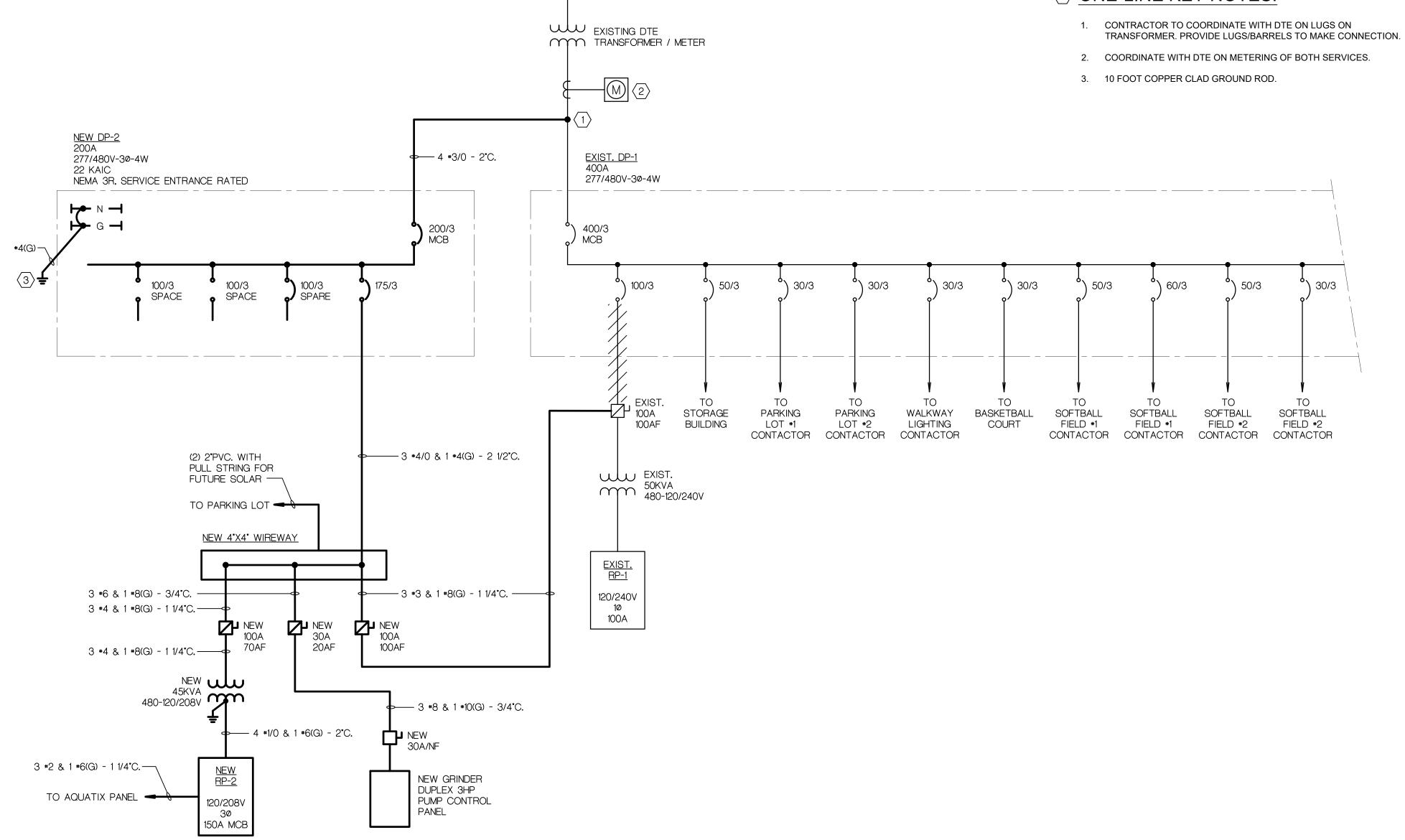
RETTICH



EDH-1 AND EDH-2 CONTROL DIAGRAM

				VOLT	AGE - 12	0/208\	, 3PH,	4W			
MAIN	150A	MCB			ITG SL	JRFACE	Ξ	LOCATION - TOILET STORAGE	10,000 AIC MINIMUM		
CIR.	BKR		LTG	REC.	MISC.	CIR.	BKR		LTG	REC	MISC
NO.			VA	VA	VA	NO.			VA	VA	VA
1	80/2	AQUATIX PANEL			13300	2	20	HAND DRYER			140
3	00/2	/ CONTON MALE	:		15000	4	20	HAND DRYER			140
5	20	SPARE				6	20	HAND DRYER			140
7	15	SPARE				8	20	CHANGING STATION			500
9	00/0				0.400	10	20	CHANGING STATION			500
11	20/2	(EDH-1			2400	12	20	CHANGING STATION			500
13	20	MOTORIZED DAMPERS	:		200	14	20	CHANGING STATION			500
15						16	20	HAND DRYER			140
17	20/2	EDH-2			2400	18	20	ECUH-1			100
19	20	SPARE				20	20	SPARE			
21	20	SPARE				22	20	SPARE			
23		SPACE ONLY				24		SPACE ONLY			
25		SPACEONLY				26		SPACE ONLY			
2 7		SPACEONLY				28		SPACE ONLY	***************************************		
29		SPACE ONLY				30		SPACE ONLY			
COLU	MN TO	TALS	0	0	18300		'	', , , , , , , , , , , , , , , , , , , 	0	0	860
ТОТА	L LIGH	TING	i		0.0	KVA					
TOTA	L RECE	PTACLES			0.0	KVA					
TOTA	L MISC	ELLANEOUS			26.9	KVA	••••••				
TOTA	CON	NECTED			26.9	KVA					

NEW DP-2	
EXISTING RP-1 DEMAND LOAD (2 PHASES)	83.4A
NEW RP-2 DEMAND LOAD	32.8A
GRINDER PUMP CONNECTED LOAD	14.4A
TOTAL DEMAND LOAD	130.6A





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Statement of Intellectual Property

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(586) 601- 4219 LE No. 23-0105 PROJECT NAME:

SCHEMATIC DESIGN DESIGN DEVELOPMENT CONSTRUCTION DOC.'S BIDS & PERMITS CONSTRUCTION

DRAWN BY: CHECKED BY:

REVISIONS:

SCHEMATIC DESIGN
DESIGN DEVELOPMENT 11/07/23 12/08/23 01/19/24 02/12/24 03/14/24 FINAL REVIEW OWNER REVIEW EGAL REVIEW PERMIT & BIDS

DATE: 19 SEPT. 2023

PROJECT NO.:

23-037

DRAWING NAME: Electrical One-Line Diagram and Panel Schedules

SHEET NO.:

ELECTRICAL SPECIFICATIONS

- ELECTRICAL CONTRACTOR SHALL INCLUDE IN THE BID ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS LISTED, MENTIONED OR SCHEDULED ON DRAWINGS AND/OR HEREIN SPECIFIED AS REQUIRED FOR COMPLETE AND OPERATING SYSTEMS.
- 2. OBTAIN AND PAY FOR ALL PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES REQUIRED AND INSURE THAT THE ENTIRE ELECTRICAL INSTALLATION CONFORMS TO CODES AND REGULATIONS REQUIRED BY AUTHORITY OR AGENCY HAVING JURISDICTION OVER THE INSTALLATION, ALTERATION OR CONSTRUCTION OF WORK INCLUDED. ALL FEES SHALL BE INCLUDED IN THE BASE PROPOSAL.
- 3. ALL ELECTRICAL WORK SHALL COMPLY WITH THE CURRENT NATIONAL ELECTRIC CODE (N.E.C.), N.F.P.A., LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS INCLUDING THE CURRENT MICHIGAN ELECTRICAL CODE PART 8 RULES.
- 4. THE CONTRACTOR SHALL VISIT THE SITE, EXAMINE AND VERIFY THE CONDITIONS UNDER WHICH HIS WORK MUST BE CONDUCTED BEFORE SUBMITTING A PROPOSAL. IN THE ELECTRICAL SECTIONS OF THE SPECIFICATIONS, THE TERMS "ELECTRICAL TRADES", "THE CONTRACTOR", OR "THIS CONTRACTOR" SHALL MEAN THE ELECTRICAL SUBCONTRACTOR.
- WHERE USED IN ELECTRICAL DOCUMENTS, "PROVIDE" SHALL MEAN "FURNISH AND INSTALL' OR 'FURNISH ALL LABOR AND MATERIALS REQUIRED FOR THE INSTALLATION OF."
- 6. EXCEPT AS OTHERWISE INDICATED ON PLAN OR HEREIN SPECIFIED, ALL MATERIALS USED SHALL BE NEW AND BEAR THE U.L. LABEL WHERE SUCH SERVICE AND LABEL ARE REGULARLY PROVIDED AND BE OF THE APPROPRIATE NEMA STANDARD. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. THIS INCLUDES MATERIALS FURNISHED BY OTHERS BUT INSTALLED BY THE ELECTRICAL CONTRACTOR AS WELL AS CONDUIT, BOXES, WIRING, ETC. INSTALLED BY THE ELECTRICAL CONTRACTOR TO SERVE EQUIPMENT SUPPLIED BY OTHERS. WHERE THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS ARE NOT PROVIDED, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO OBTAIN SAME. ALL MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH ITS UL LISTING. IF UL LISTING REQUIREMENTS ARE NOT PROVIDED. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO OBTAIN SAME. INCLUDE THE COST OF CONFORMING TO SAME IN THE BID.
- 7. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TESTS AND INSPECTIONS NECESSARY TO DETERMINE THAT ALL WIRING AND EQUIPMENT INSTALLED UNDER THIS SPECIFICATION IS IN SATISFACTORY CONDITION AND SHALL BE PERFORMED TO THE SATISFACTION OF THE ELECTRICAL INSPECTOR OF THE LOCAL AUTHORITY AND TO ALL OTHERS HAVING JURISDICTION OVER THE ELECTRICAL WORK.
- A. THE ELECTRICAL CONTRACTOR SHALL DELIVER THE CERTIFICATES OF INSPECTION AND FINAL APPROVAL TO THE ARCHITECT AS A REQUIREMENT FOR FINAL PAYMENT.
- B. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE IN WRITING ALL WORK IN CONNECTION WITH HIS ELECTRICAL CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF COMPLETION AND ACCEPTANCE BY THE OWNER. ALL WORK AND MATERIALS REQUIRED BY THE ELECTRICAL CONTRACTOR IN ORDER TO SATISFY THE GUARANTEE SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE SHOP DRAWINGS IN A PDF FORMAT FOR ALL MAJOR PIECES OF ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO THE FOLLOWING.
- A. MOTOR STARTERS
- B. SAFETY/DISCONNECT SWITCHES
- C. PANELBOARDS
- D. LIGHT FIXTURES
- E. LIGHTING CONTROLS
- F. TRANSFORMERS
- G. WIRING DEVICES INCLUDING COVERPLATES
- 9. ON COMPLETION OF WORK AND BEFORE FINAL PAYMENT IS MADE. THIS CONTRACTOR SHALL PREPARE 'AS-BUILT DRAWINGS'. CLEARLY INDICATE ON A SET OF CONTRACT DRAWINGS ALL THE CHANGES MADE DURING CONSTRUCTION, DUE TO FIELD CONDITIONS, ADDENDA, BULLETINS, ETC. DRAWINGS SHALL INDICATE THE INSTALLED LOCATION OF ALL EQUIPMENT, OUTLETS, ETC.

BASIC MATERIALS AND METHODS

- 1. PAINTING BY THE ELECTRICAL CONTRACTOR IS NOT REQUIRED.
- 2. ALL CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF ELECTRICAL WORK SHALL BE BY THE ELECTRICAL CONTRACTOR.
- 3. EMPTY CONDUIT INSTALLED BY THIS CONTRACTOR, SHALL BE COMPLETE WITH A NYLON PULL WIRE.
- 4. BRANCH CIRCUIT WIRE AND CABLE SHALL BE COPPER WITH 98% CONDUCTIVITY AND SHALL MEET THE TESTS AND STANDARDS SET FORTH BY NEMA, U.L. AND IPCEA. WIRE SHALL BE COPPER.
- 5. ALL WIRE USED BELOW GRADE SHALL BE XHHW-2, 90 DEGREES C, COPPER.
- WIRE USED ABOVE GRADE MAY BE XHHW-2 OR THHN-THWN, 90 DEGREES C.
- 7. ALUMINUM WIRE SHALL NOT BE USED UNLESS CALLED OUT.
- 8. METAL CLAD CABLE AND ARMORED CABLE SHALL NOT BE USED.
- 9. CONDUIT SURFACE MOUNTED ON THE BUILDING EXTERIOR IS NOT ALLOWED.
- 10. ALL PVC CONDUIT AND BOXES SHALL BE CARLON OR APPROVED EQUAL.
- 11. CONDUIT USED INDOORS SHALL BE SCHEDULE 40 PVC.
- 12. CONDUIT USED BELOW GRADE SHALL BE SCHEDULE 80 PVC.
- 13. CONDUIT USED OUTDOORS ABOVE GRADE SHALL BE HEAVY WALL GALVANIZED RIGID STEEL WITH THREADED FITTINGS OR SCHEDULE 80 PVC.
- CONDUIT SHALL BE INSTALLED AT A DEPTH OF 42" OR GREATER BELOW
- 15. ALL PVC CONDUIT SHALL BE INSTALLED WATERTIGHT AND SHALL USE PVC CEMENT AND PRIMER, INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. CONDUIT ENDS SHALL BE CLEANED AND DRIED PRIOR TO THE APPLYING CEMENT.
- 16. PVC OUTLET BOXES, FITTINGS AND JUNCTION BOXES SHALL BE USED FOR ALL OUTLETS, PULL BOXES, JUNCTION BOXES, ETC. LIGHTING FIXTURES SHALL NOT BE SUPPORTED OR HUNG FROM PVC JUNCTION BOXES BUT SHALL BE SUPPORTED INDEPENDENTLY FROM THE BUILDING CONSTRUCTION.
- 17. EXPOSED CONDUITS SHALL BE MOUNTED SECURELY BY SUITABLE HANGERS OR STRAPS WITH THE MAXIMUM SPACING OF POINTS OF SUPPORTS NOT

- GREATER THAN INDICATED BY NEC ARTICLE 347-8 SUPPORTING OF CONDUIT.
- 18. CONDUITS SHALL NOT BE SUPPORTED FROM THE BUILDING STRUCTURE AND NOT FROM OTHER UTILITIES, PIPE, OR PIPE SUPPORTS.
- 19. CONDUITS SHALL BE INSTALLED IN NEAT SYMMETRICAL LINES PARALLEL WITH THE BUILDING CONSTRUCTION AND ADJACENT TO BEAMS, WALLS, ETC. AND NOT ACROSS OPEN BAYS.
- 20. INCLUDE EXCAVATING AND BACKFILLING AS REQUIRED FOR THE INSTALLATION OF ELECTRICAL WORK. BACKFILL INSIDE BUILDING AND UNDER TRAFFIC AREAS WITH WELL TAMPED SAND, BACKFILL WITHIN 45 DEGREE ANGLE BELOW FOOTING WITH LEAN MIX CONCRETE. BACKFILL UNDER DRIVES AND PARKING AREAS SHALL BE PLACED IN LAYERS NOT MORE THAN 8" IN THICKNESS. 95% COMPACTION IS REQUIRED THROUGHOUT WITH APPROVED COMPACTION EQUIPMENT. TAMP AND ROLL AS REQUIRED. EXCAVATED MATERIAL SHALL NOT BE USED. BACKFILL OUTSIDE BUILDING WITH SAND TO A HEIGHT OF 12" OVER TOP OF PIPE. COMPACT TO COMPACTION AS SPECIFIED ABOVE. BACKFILL REMAINDER OF EXCAVATION WITH UNFROZEN EXCAVATED MATERIALS IN SUCH A WAY AS TO PREVENT SETTLING.
- PROVIDE AND INSTALL WARNING TAPE ABOVE ALL UNDERGROUND CONDUITS. WARNING TAPE SHALL BE LOCATED 18 INCHES ABOVE TOP OF CONDUIT OR 1/2 WAY BETWEEN TOP OF CONDUIT AND GRADE. THE WARNING TAPE SHALL BE HEAVY GAUGE 0.004 POLYETHYLENE FILM, RESISTANT TO, ACIDS, ALKALIES, AND OTHER SOIL COMPONENTS. THE TAPE SHALL BE YELLOW IN COLOR FOR ELECTRIC POWER AND LIGHTING CONDUITS, GREEN IN COLOR FOR TELEPHONE AND ORANGE IN COLOR FOR DATA. THE TAPE SHALL BE CONTINUOUS WITH A TOP LINE THAT READS "CAUTION" AND A BOTTOM LINE THAT READS "ELECTRIC LINE BURIED BELOW' OR 'TELEPHONE LINE BURIED BELOW'. OR 'DATA LINE BURIED BELOW", AS REQUIRED. WHERE WARNING TAPE SPLICES OCCUR OVERLAP THE TAPE A MINIMUM OF 10 FEET. THE UNDERGROUND WARNING TAPES SHALL BE AS MANUFACTURED BY SETON NAME PLATE CORP. OR BRADY.
- 22. DUCTS AND CONDUITS WHICH ARE INSTALLED UNDERGROUND OR BENEATH FLOOR SLAB SHALL BE CLEARED OF FOREIGN MATERIAL AND OBSTRUCTIONS AFTER INSTALLATION AND BEFORE CONDUCTORS OR PULL-WIRES ARE DRAWN IN BY WIRE BRUSHING, SWABBING AND EMPLOYING AN IRON OR HARDWOOD MANDREL WHICH IS 1/4" SMALLER IN DIAMETER THAN THE INTERNAL DIAMETER OF THE DUCT OR CONDUIT. THE INSTALLATION OF CONDUCTORS OR PULL WIRE SHALL NOT BE MADE UNTIL THE RACEWAYS ARE FOUND ACCEPTABLE.
- 23. LIQUID-TIGHT FLEXIBLE STEEL CONDUIT FOR CONNECTION TO MOTORS, TRANSFORMERS AND SPECIAL EQUIPMENT SHALL BE FLEXIBLE STEEL WITH PVC JACKET AND GROUNDING JUMPER.
- 24. ELECTRIC SYSTEM GROUNDING SHALL IN ALL INSTANCES COMPLY WITH THE MINIMUM REQUIREMENTS OF THE N.E.C. METAL ENCLOSURES SHALL BE BONDED TOGETHER AND GROUNDED TO THE BUILDING GROUND SYSTEM. ALL CONDUITS SERVING WIRING OF 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE. ALL CONDUIT SERVING WIRING 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE. ALL GROUND CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE NEC. MINIMUM SIZE GROUND WIRE SHALL BE 12 AWG
- 25. AT TWO OPPOSITE CORNERS OF THE BUILDING, INSTALL A BELOW GRADE GROUND ROD. USE THE GROUND ROD AND COPPER GROUND CABLE TO CONNECT TO REINFORCING STEEL WITHIN THE BUILDING FOUNDATION. INSTALLATION SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS. REFER TO INFORMATION ON PLAN FOR ADDITIONAL REQUIREMENTS.
- 26. ALL 120 VOLT BRANCH CIRCUITS SERVING RECEPTACLES SHALL UTILIZE A SEPARATE DEDICATED NEUTRAL.
- 27. WIRING DEVICES SHALL BE HUBBELL, PASS & SEYMOUR, LEVITON OR COOPER. ALL DEVICES SHALL BE SPECIFICATION GRADE HEAVY DUTY AND OF THE SAME MANUFACTURER. COMMERCIAL OR RESIDENTIAL GRADE DEVICES SHALL NOT BE USED. ALL LIGHTING SWITCH OPERATING HANDLES AND RECEPTACLE BODIES COLORS SHALL BE BROWN.
- 28. LINE VOLTAGE SWITCHES SHALL BE 20 AMP, AC QUIET, 125 VOLT, SINGLE POLE, ALL LIGHTING SWITCH OPERATING HANDLES SHALL BE BROWN, HUBBELL 1221BN SERIES OR APPROVED EQUAL.
- 29. GFCI RECEPTACLES SHALL BE DUPLEX GFCI TYPE, TOTALLY ENCLOSED, SELF GROUNDING TYPE, 20 AMP, 125 VOLT, WHITE BODY, TAMPER AND WEATHER RESISTANT, INDUSTRIAL GRADE, HUBBELL GFR5362 OR APPROVED
- 30. ALL RECEPTACLES AND SWITCHES SHALL BE WIRED USING THE WIRING DEVICE TERMINALS. BACK WIRING IS NOT ALLOWED.
- 31. ALL EXTERIOR GFCI RECEPTACLES SHALL UTILIZE A WEATHERPROOF, WHILE IN USE, METALLIC COVERPLATE, GRAY FINISH, HUBBELL TAYMAC #MX5280S.
- 32. ALL DEVICE PLATES FOR BOXES AND SWITCHES IN FINISHED AREAS SHALL BE STAINLESS STEEL, TYPE 302 WITH BEVELED EDGES.
- 33. ALL DEVICE PLATES FOR BOXES AND SWITCHES IN UNFINISHED AREAS SHALL BE CADMIUM OR ZINC PLATED STEEL.
- 34. NAMEPLATES SHALL BE PROVIDED ON ALL EQUIPMENT, DISCONNECT SWITCHES, MOTOR STARTERS, PANELBOARDS, RECEPTACLES, ETC. NAMEPLATES SHALL BE ENGRAVED LAMICOID TYPE WITH BLACK LETTERS ON WHITE BACKGROUNDS. THE USE OF DYMO OR ADHESIVE LABELS IS NOT ACCEPTABLE. ALL NAMEPLATES SHALL BE MECHANICALLY FASTENED. ADHESIVE ATTACHMENT IS NOT PERMITTED.
- NAMEPLATES SHALL USE BLACK LETTERS ON A WHITE BACKGROUND. RECEPTACLE NAMEPLATES SHALL USE 3/16" HIGH LETTERS. MOTOR STARTERS AND DISCONNECT SWITCHES SHALL UTILIZE 1/4" HIGH LETTERS. PANELBOARD SHALL UTILIZE 1/2" HIGH LETTERS.
- 36. PROVIDE TYPES PANELBOARD DIRECTORY IN PANELBOARD.
- 37. UPDATE EXISTING PANEL DIRECTORIES PRIOR TO COMPLETION.

POWER DISTRIBUTION EQUIPMENT

- DISTRIBUTION EQUIPMENT SHALL BE UL LISTED AND SHALL CONFORM TO THE LATEST APPLICABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND THE LATEST APPLICABLE STANDARDS OF IEEE, ANSI AND NEMA.
- MANUAL MOTOR STARTERS SHALL BE 16 AMP, 120 VOLT, TOGGLE SWITCH TYPE COMPLETE WITH OVERLOADS MANUFACTURED BY SQUARE-D, EATON, GENERAL ELECTRIC OR SIEMENS.
- ALL NEW CIRCUIT BREAKERS TO BE INSTALLED IN THE EXISTING PANELBOARDS SHALL BE OF THE SAME MANUFACTURER AND TYPE AS THE EXISTING CIRCUIT BREAKERS. NEW CIRCUIT BREAKERS SHALL BE OF THE SAME AIC RATING AS EXISTING AND SHALL BE COMPLETELY COMPATIBLE WITH THE EXISTING PANELBOARD.
- 4. ALL EXTERIOR EQUIPMENT SHALL BE SHALL NEMA 3R.
- PANEL SHALL BE 120/208 VOLT, THREE PHASE, FOUR WIRE, CIRCUIT BREAKER TYPE WITH MAIN CIRCUIT BREAKER, BOLT IN BREAKERS, MINIMUM 20' WIDE X 5-3/4' DEEP SURFACE MOUNTING, NEMA 3R, COPPER BUSING COMPLETE WITH GROUND BUS. CIRCUIT BREAKERS SHALL BE 10,000 A.I.C. PANEL SHALL BE PAINTED WITH A PRIME AND A FINISH FACTORY COAT OF MANUFACTURER'S STANDARD GREY ENAMEL.
- TRANSFORMER SHALL BE 3 PHASE, NEMA 1, 150°C RATED, AND ALUMINUM

LIGHTING REQUIREMENTS

- REFER TO THE LIGHTING FIXTURE SCHEDULE SHOWN ON ELECTRICAL DRAWINGS FOR A COMPLETE DESCRIPTION OF ALL LIGHTING FIXTURES.
- 2. LIGHT FIXTURES SHALL BE PROVIDED AS A COMPLETE PACKAGE IN LED LIGHT ENGINE, DRIVER, OVER CURRENT PROTECTION AND MINIMUM 2 KV SURGE PROTECTION. ALL EXTERIOR LIGHT FIXTURES SHALL INCLUDE A 10 KV SURGE SUPPRESSION UNIT.
- 3. ALL LIGHT FIXTURES SHALL BE LED TYPE, MINIMUM 80,000 HOURS OF OPERATION AND 5 YEAR WARRANTY.
- 4. ALL LIGHTING FIXTURES SHALL BE UL LISTED, COMPLETE IN EVERY DETAIL, PROPERLY WIRED AND CONNECTED WITH CONDUITS SUPPLYING SAME.
- 5. ALL LIGHTING FIXTURES SHALL COMPLY WITH ALL REQUIREMENTS OF STATE AND LOCAL CODES AND THE N.E.C. AS WELL AS ASHRAE 90.1.
- 6. ALL LIGHT FIXTURES SHALL BE SUPPORTED FROM THE BUILDING CONSTRUCTION. COORDINATE MOUNTING AND EXACT LOCATION OF ALL LIGHT FIXTURES WITH ARCHITECTURAL TRADES.

OCCUPANCY SENSORS/LIGHTING CONTROLS

- 1. PROVIDE OCCUPANCY SENSORS AND LIGHTING CONTROLS AS INDICATED
- 2. ALL OCCUPANCY SENSORS SHALL BE WHITE.
- SUBMIT STANDARD CATALOG LITERATURE WHICH INCLUDES PERFORMANCE SPECIFICATIONS INDICATING COMPLIANCE TO THE SPECIFICATION.
- 4. ALL SENSORS SHALL PROVIDE AN LED AS A VISUAL MEANS OF INDICATION AT ALL TIMES TO VERIFY THAT MOTION IS BEING DETECTED DURING BOTH TESTING AND NORMAL OPERATION.
- 5. CONTROL UNITS FOR EASE OF MOUNTING, INSTALLATION AND FUTURE SERVICE, CONTROL UNIT(S) SHALL BE ABLE TO EXTERNALLY MOUNT THROUGH A 1/2" KNOCK-OUT ON A STANDARD ELECTRICAL ENCLOSURE AND BE AN INTEGRATED, SELF-CONTAINED UNIT CONSISTING INTERNALLY OF AN ISOLATED LOAD SWITCHING CONTROL RELAY AND POWER SUPPLY TO PROVIDE LOW-VOLTAGE POWER. CONTROL UNIT SHALL PROVIDE POWER TO A MINIMUM OF TWO (2) SENSORS, EMERGENCY LIGHTING LOAD TRANSFER MAY BE INTEGRAL TO THE LIGHTING CONTROLLER.
- CONTROL WIRING BETWEEN SENSORS AND CONTROLS UNITS SHALL BE CLASS II, 16 AWG, STRANDED U.L. CLASSIFIED, PVC INSULATED CABLE SUITABLE FOR USE IN PLENUMS, WHERE APPLICABLE UNLESS OTHERWISE REQUIRED. ALL LOW VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT
- PROVIDE A LOW VOLTAGE LIGHTING CONTROL STATION UTILIZING A SINGLE BUTTON TO TOGGLE LIGHTS ON AND OFF. CONTROL STATION SHALL BE WITH WHITE BUTTON AND BODY AND STAINLESS STEEL COVERPLATE.
- 8. ALL OCCUPANCY SENSORS SHALL BE FOR COLD TEMPERATURE STARTING
- EQUIPMENT SHALL BE MANUFACTURED BY WATT STOPPER, LUTRON, SENSORSWITCH, HUBBELL, EATON OR LEVITON.

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PROJECT NAME:

O

SCHEMATIC DESIGN DESIGN DEVELOPMENT

CONSTRUCTION DOC.'S **BIDS & PERMITS** CONSTRUCTION

> DRAWN BY: CHECKED BY:

REVISIONS: SCHEMATIC DESIGN DESIGN DEVELOPMENT

FINAL REVIEW

KEVIN C.

RETTICH

34542

ENGINEER

OWNER REVIEW

02/12/24 EGAL REVIEW PERMIT & BIDS 03/14/24

11/07/23

12/08/23

01/19/24

DATE: 19 SEPT. 2023

PROJECT NO .:

23-037

DRAWING NAME: Electrical Specifications



BICENTENNIAL PARK SPLASH PAD

ANN ARBOR, MI

INTRODUCTION:

SPLASH PAD TO CONSIST OF A 81'-7" X 43'-5" FREEFORM CONCRETE PAD WITH THE FOLLOWING PLAY FEATURES:

N	0	PRODUCT	QTY
1		AQUAGATHER	1
2		HYDROHELIX W/ACRYLIC	1
3		HYDROSPHERE	2
4		SPRAYSHROUD	1
5		VERSOSPLASH	1
6		WHILFLEX	1
7		ARCH JET	2
8	ŀ	FUNNEL TWIST	1
9		GROUND FUNNEL	3
10	0	JR WATER JEWEL	3
1	1	MINI UPWARD SPRAY RING	2

DRAINAGE SYSTEM TO CONSIST OF (3) COLLECTOR BOX W/

MECHANICAL SYSTEM TO BE LOCATED IN A NEARBY MECHANICAL ENCLOSURE

RECIRCULATION SYSTEM TO INCLUDE:

1 - FILTRATION PUMP 1 - SAND FILTER

- 1 CHEMICAL CONTROL SYSTEM 1 CHLORINE TANK AND PUMP
- ACID TANK AND PUMP
- 1 UV DISINFECTION SYSTEM 1 FEATURE PUMP
- DISTRIBUTION HEADER
- 1 UNDERGROUND WATER RESERVOIR
- 1 CONTROL PANEL ON/OFF

REQUIRED UTILITIES:

DOMESTIC WATER MAKE-UP:
DOMESTIC WATER SUPPLY WITH AN APPROVED BACKFLOW
PREVENTER AND PRESSURE REGULATOR REGULATED TO 25-30PSI AND AN AIR GAP IN ACCORDANCE WITH LOCAL

PROVIDED FOR WASHING DOWN THE ENTIRE DECK AREA.***

(1) FEED @ 208/230V, 1Ø, 60hz, 80 amps W/ NEUTRAL (SPLASH PAD MECH)
(2) FEEDS @ 120V, 1Ø, 60hz, 10 amp W/ NEUTRAL (CHEMICAL FEEDERS)



by landscape structures

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SPLASH PAD DRAWING LIST:

- **COVER SHEET**
- GENERAL INFORMATION SITE PLAN
- SPLASH PAD LAYOUT CONCRETE PLAN
- 6: CONCRETE FORM
- CONCRETE SECTION AND DETAILS
- DEBRIS TRAP/DRAIN TO WASTE DETAILS
- SUPPLY PIPING PLAN
- 9: DRAIN PIPING PLAN
- 10: ELECTRICAL PLAN MECHANICAL PLAN
- STORAGE TANK DETAILS



AND STATE CODES
***IT IS RECOMMENDED THAT A HOSE BIBB AND A VACUUM BREAKER TO BE

2. UNDERGROUND STORAGE TANK OVERFLOW: 3" SCH 80 PVC TO WASTE. AIR GAP REQUIRED.

3a) 4" SCH 80 PVC DRAIN TO WASTE W/ BUTTERFLY ACTUATED VALVE (FROM COLLECTOR BOXES). AIR GAP REQUIRED.

3b) 4" SCH 80 PVC DRAIN TO WASTE (FROM MECHANICAL ENCLOSURE) AIR GAP REQUIRED.



JOB NO 1175457



GENERAL SPLASH PAD DATA					
NOMINAL TOTAL SURFACE AREA: 2,762 sq.ft. NOMINAL PAD SURFACE AREA: 1,804 sq.ft. NOMINAL APRON SURFACE AREA: 958 sq.ft.					
NOMIN NOMIN TANK	AL FILTER TURNOVER RATE: ½ ho AL FILTER FLOW RATE: 100 GPM WORKING VOLUME: 3,000 GALLON	our MIN. NS			
	AL TOTAL FEATURE FLOW: 326 G AL FEATURE FLOW RATE:	РМ			
NO	PRODUCT	QTY			
1	AQUAGATHER 1				
2	HYDROHELIX W/ACRYLIC 1				
3	HYDROSPHERE 2				
4	SPRAYSHROUD 1				
5	VERSOSPLASH 1				
6	WHILFLEX	1			
7	ARCH JET	2			

1

3

3

2

WATER QUALITY GUIDELINES

FUNNEL TWIST

GROUND FUNNEL

JR WATER JEWEL

MINI UPWARD SPRAY RING

FOR PROPER SPLASH PAD OPERATION MAINTAIN, THE FOLLOWING WATER CHEMISTRY:

1. pH BALANCE: 7.2-7.8

8

9

10

11

- 2 FREE CHI ORINE RESIDUAL: 3.0-5.0 ppm
- 3. TOTAL DISSOLVED SOLIDS: LESS THEN 1000ppm 4. CALCIUM HARDNESS: 200-400 1500ppm
- 5. TOTAL ALKALINITY: 80-180ppm AS CALCIUM
- CARBONATE
- 6 FILTRATION TURNOVER RATE: 30 MINS HOLDING TANK WATER SHALL BE FREE OF COLIFORM BACTERIA CONTAMINATION.

START-UP CHECK LIST

- ALL ELECTRICAL CONNECTIONS MUST BE TESTED AFTER
- 2. TEST PUMP MOTORS AND VERIFY PROPER ROTATION AND RUNNING AMPERE AT THE CONTROL PANEL. PUMPS MUST NOT BE RUN DRY.
- 3. INSPECT ALL PIPING AND PIPING ACCESSORIES FOR LEAKS ONCE PIPES ARE FILLED WITH WATER. 4. PRIOR TO OPERATION, FLUSH ALL LINES OF
- ACCUMULATED DEBRIS. 5. TEST ALL HYDRAULIC LINES AND FITTINGS FOR LEAKS.
- REPAIR IF NECESSARY AND FLUSH CLEAN. 6. ALL CUSTOM WATER DEVICES, ETC. MUST BE PROPERLY
- INSTALLED AND ADJUSTED FOR PROPER PERFORMANCE
- 7. VERIFY PROPER INCOMING WATER PRESSURE BEFORE

SOIL EXCAVATIONS:

REMOVE ALL EXISTING FILL SOILS AND ANY SILTY SANDS (INCLUDING NATURALLY DEPOSITED SOILS), SOILS EXPOSED IN THE EXCAVATION BOTTOM SHOULD CONSIST OF NATURAL COARSE ALLUVIAL SANDS (SP OR SP-SM). SOILS EXPOSED IN THE EXCAVATION BOTTOM SHOULD BE THOROUGHLY SURFACE COMPACTED. FILL PLACED IN THE EXCAVATION SHOULD CONSIST OF NON-FROST SUSCEPTIBLE SANDS HAVING 5% OR LESS PARTICLES (BY WEIGHT) FINER THAN THE #200 SIEVE AND 40% OR LESS PARTICLES FINER THAN THE #40 SIEVE FILL SHOULD BE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM: D698). REMOVE ALL BACKFILL THAT DOES NOT CONFORM TO MATERIAL SPECIFICATION (SP OR SP-SM CLASSIFICATION) OR MEET COMPACTION REQUIREMENTS, CONSULT SOILS REPORT OR TESTING LABORATORY AS NECESSARY

BILL OF MATERIALS:

1. (23) WATERPLAY FEATURES (SEE GENERAL SPLASH PAD DATA)

MECH2O SYSTEM AND COMPONENTS:

- 2. FILTRATION SYSTEM COMPONENTS: 2a) (1) FILTER PUMP - PENTAIR INTELLIFLO, MODEL# VSF P, 230V, 1Ø 16.0AMP-135 GPM@60'TDF
- 2b) (1) SAND FILTER PENTAIR TRITON C, MODEL #TR-140-C, COMM, RATING: 141GPM EA 2c) (13) 50LBS. OF SAND - HIGH RATE SAND FILTER
- SAND, SUPERIOR POOLS, PART #AAA-200 2d) (6) 50LBS. OF GRAVLE - HIGH RATE SAND FILTER
- GRAVLE, SUPERIOR POOLS, PART #AAA-206 2e) (1) MULTIPORT VALVE - PENTAIR 2" MUI TIPORT
- VALVE WITH SIGHT GLASS, MODEL #261055 2f) (1) AUTOMATIC CHEMICAL CONTROLLER - CAT CONTROLS 110V. 5AMP INCLUDES LIQUID ACID PUMP
- 2g) (1) FLOW METER H2FLOW CONTROLS 3" PIPE, MODEL # FV-3
- 2h) (1) ELECTRICAL PANEL UL LISTED, PRE-TESTED
 2i) (1) CHORINE FEEDER CHLORINE EROSION FEEDER SYSTEM
- ACCU-TAB MODEL #1030 2j) (1) Ph SYSTEM - WATER Ph ADJUSTMENT SYSTEM ACID-RITE MODEL #450
- 2k) UV SYSTEM AND CONTROL PANEL HAYWARD, HYDRORITE MODEL #HYR150L4, 133GPM, 120V/3AMP
- 3. FEATURE SYSTEM COMPONENTS:
- 3a) (1) FEATURE PUMP -PENTAIR EQ SERIES, MODEL# EQ-750 7.5 HP, 230V, 1Ø 30.4 AMP-425GPM@50'TDH
- 3b) (1) HEADER 6" DIA PREFABRICATED DISTRIBUTION MANIFOLD, EACH SUPPLY LINE TO HAVE INDIVIDUAL MANUAL CONTROL VALVES.
- 4. TANK AND TANK COMPONENTS:
- 4a) (1) UNDERGROUND RESERVOIR PRECAST CONCRETE TANK LOCKABLE HATCH AND LADDER (3,000 GALLON WORKING CAPACITY-3,000 TOTAL CAPACITY) SEE SHEET 1/12 AND 12/12. ***TANK TO BE PREPLUMBED AND OUTFITTED***
- 4b) (2) SUMP PUMP FLOTEC SUMP PUMP, 115V, 15AMPS, W/ J-BOX FOR ELECTRICAL CONDUIT LOCATED WITHIN TANK. MODEL #FPSE3200A
- 4c) (1) SKIMMER AQUATIC RECREATION COMPANY. LLC FLOATING SKIMMER W/INTAKE HOSE.
- 4d) (1) WATER LEVEL CONTROL VALVE MECHANICAL HUDSON FLOAT VALVE (1" LINE) MCMASTER CARR 46585K14
- 4e) (1) FILTRATION RETURN PLUMBING LOOP - 3" PVC PIPE W/ (16) ¾" DISCHARGE PORTS **FACING DOWN INTO TANK**

(SEE DRAWING 12 FOR DETAILS)

- 5 MISCELLANEOUS COMPONENTS:
- 5a) (1) ACTIVATION BOLLARD PVC STRUCTURE W/ TOUCH SENSOR (3 WIRE PROXIMITY SWITCH, 22AWG, 0-36VDC LOW VOLTAGE) TO ACTIVATE THE FEATURE PUMP FOR A SET DURATION OF TIME.
- 5b) (3) DRAIN BOX 12" PVC SUMP W/FRP
- GRATE TOP, NOMINAL CAPACITY OF 120 GPM. 5c) (1) DEBRIS WASTE CHAMBER PREFABRICATED SUMP VITH REMOVABLE STAINLESS STEEL DEBRIS TRAP AND A 6" ACTUATED BUTTERELY VALVE (115V, 0.50 amps). THAT WILL ACTIVATE WHEN THE SYSTEM IS NOT OPERATING TO ALLOW WATER (SUCH AS RAIN) THAT ACCUMULATES IN THE COLLECTOR BOX TO DRAIN
- *** ALL MECHANICAL SKID SYSTEMS TO BE PROVIDED BY SPLASH PAD MANUFACTURE TO BE PRE-PLUMBED, PRE-WIRED AND FULLY TESTED.

GENERAL SPLASH PAD NOTES:

- INSTALLER SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS. ANY CHANGES OR REVISIONS TO THE DRAWINGS AFTER THE DRAWINGS HAVE BEEN APPROVED IS THE RESPONSIBILITY OF THE INSTALLING PARTY
- 2. IT IS THE INSTALLERS RESPONSIBILITY TO LOCATE ALL JTILITIES AND ALL OTHER FACILITIES ABOVE AND BELOW GRADE PRIOR TO PERFORMING ANY WORK.
- 3. DURING THE COURSE OF CONSTRUCTION, THE INSTALLER SHALL MAINTAIN AN ACCURATE RECORD OF ALL ELEVATIONS AND CHANGES OF THE APPROVED WORK AND DOCUMENT THE ACTUAL INSTALLATION ON A SET OF REPRODUCIBLE DRAWINGS
- 4. IT IS RECOMMENDED THAT A LIGHTENING DETECTION DEVICE
- BE INSTALLED INTO THE SPLASH PAD SYSTEM. 5. IT IS RECOMMENDED THAT A VALIDATED UV SYSTEM BE INSTALLED INTO THE SPLASH PAD SYSTEM.
- 6. THE BACKFLOW PREVENTER ON THE WATER MAKE-UP LINE SHALL INCLUDE A PRESSURE REDUCING VALVE AND PRESSURE GAUGE. THE INSTALLER MUST SET THE INCOMING COLD WATER LINE PRESSURE BELOW 30 PSI BEFORE INITIAL SPLASH PAD START-UP.
- ALL COMPONENTS OF THE FILTRATION AND RECIRCULATION
- SYSTEM MUST BE NSF APPROVED. ELEVATIONS AND CENTER LINES ARE FOR REFERENCE PURPOSES ONLY. IT IS THE INSTALLERS RESPONSIBILITY TO DETERMINE AND VERIFY ACTUAL CENTER LINES, LOCATIONS, AND ELEVATIONS.
- ALL MECHANICAL INSTALLATION WORK SHALL BE COMPLETED IN A WORKMAN LIKE MANNER ACCORDING TO STANDARD INDUSTRY PRACTICE AND WARRANTED.
- 10. EQUIPMENT SUPPLIER SHALL WARRANTY ALL PRODUCTS AGAINST DEFECTS IN WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS FROM DATE OF INSTALLATION.
- 11. IF PRODUCT AND ASSOCIATED MECHANICAL SYSTEM (SUPPLY LINE, DRAIN LINE, HEADER, PUMP, FILTER, ETC.) REQUIRES WINTERIZATION, IT IS TO BE PERFORMED BY EITHER A QUALIFIED CONTRACTOR OR QUALIFIED MAINTENANCE PERSONNEL TRAINED IN PROPER WINTERIZATION
- 12. THERE MUST BE NO DIRECT PHYSICAL CONNECTION BETWEEN THE SEWER SYSTEM AND ANY DRAIN FROM THE SPLASH PAD OR RECIRCULATION SYSTEM
- 13 SIGNAGE MUST BE PROVIDED IN ACCORDANCE WITH LOCAL AND STATE USER SANITATION AND SAFETY CODES.
- 14. THE OWNER IS RESPONSIBLE FOR DESIGNATING A PERSON TO OPERATE AND MAINTAIN THE SPLASH PAD AND ALL RELATED FACILITIES AND EQUIPMENT IN ACCORDANCE WITH LOCAL AND STATE OPERATION AND MAINTENANCE CODES.

 15. A RECORD OF THE SPLASH PAD'S OPERATION AND
- ROUTINE MAINTENANCE MUST BE KEPT BY THE DESIGNATED OPERATOR IN ACCORDANCE WITH LOCAL AND STATE CODES.

 16. TOILETS, SHOWERS, DRINKING FOUNTAINS, AND DRESSING
- OOMS MUST BE CONVENIENTLY AVAILABLE TO POOL PATRONS IN ACCORDANCE WITH LOCAL AND STATE CODES

PLUMBING NOTES:

- PIPING IS DRAWN FOR CLARITY AND DOES NOT NECESSARILY INDICATE EXACT ROUTING. CONTRACTOR SHALL INSTALL PIPING WITH AS FEW CHANGES IN DIRECTION AND ELEVATION AS JOB SITE CONDITIONS WILL ALLOW.
- 2. ALL PIPE AND FITTINGS RECOMMENDED TO BE SCH 80 PVC (SCH 40 ACCEPTABLE). INSTALLER RESPONSIBLE FOR ALL PIPE, PIPE FITTINGS, FLANGES, GASKETS, ELBOWS, AND HARDWARE TO CONNECT ALL EQUIPMENT TO OPERATE
- 3. MINIMIZE THE USE OF 90°ELBOWS ON PUMP SUCTION LINES. MAINTAIN 10 TIMES PIPE DIAMETER OF STRAIGHT PIPE ON PUMP SUCTION LINE BEFORE PUMP.
- ALL NON-DRAIN PIPING MUST BE PRESSURE TESTED PRIOR TO BACKFILLING. WATER TESTING LINES AT 30 PSI FOR (1) HOUR WITH NO PRESSURE DROP IS THE PREFERRED METHOD OF TESTING ISOLATE ALL PIPING APPURTENANCES FROM THE PRESSURE OF THIS TEST, AS THEY ARE NOT DESIGNED FOR HIGH PRESSURE OPERATION AND DAMAGE MAY OCCUR. ALL TEST FAILURES SHALL BE CORRECTED
- **WARNING: NOT INTENDED FOR USE WITH COMPRESSED AIR OR GAS. THIS PRODUCT IS ONLY TO BE USED FOR ITS INTENDED PURPOSE,*
- ALL DISCHARGE, SUCTION, AND DRAIN LINES MUST HAVE A MEANS FOR DRAINAGE SUPPLIED BY THE GENERAL CONTRACTOR FOR WINTERIZATION
- SUCTION LINE VELOCITY NOT TO EXCEED 5 FT/SEC.
- SUPPLY LINE VELOCITY NOT TO EXCEED 10 FT/SEC. GRAVITY DRAIN LINE VELOCITY NOT TO EXCEED 3.0 FT/SEC
- DRAINAGE GRATING VELOCITY NOT TO EXCEED 1 FT/SEC. 10. PROVIDE ALL PIPE AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURE RECOMMENDATIONS AND APPLICABLE CODES
- AND REGULATIONS. SUPPORT ALL PIPE LINES INDIVIDUALLY, EACH BRANCH HAVING AT LEAST ONE HANGER, IF NOT SPECIFICALLY NOTED, PROVIDE VERTICAL AND LATERAL SUPPORT FOR ALL PIPING AND EQUIPMENT
- 12. PIPE SHALL BE INDEPENDENTLY SUPPORTED OF ALL PUMPS AND EQUIPMENT.
- 13. PROTECT PLASTIC PIPE IN STEEL SUPPORT BRACKETS. 14 SIZE HANGERS PROPERLY TO FIT AROUND PIPES AND SIZE HANGER RODS, SCREWS, BOLTS, NUTS, ETC. ACCORDING TO MANUFACTURES SIZING CHARTS
- 15. SPACE HANGERS FOR HORIZONTAL PIPES AT MAXIMUM 4FT FOR 1" PIPE AND UNDER, 5FT FOR 2" UNDER, 7FT FOR 4" UNDER, 9FT FOR 6" UNDER, 10FT FOR 8" UNDER, 11FT FOR 10" UNDER AND 12FT FOR 12" OR LARGER.
- 16. DO NOT USE WIRE OR OTHER MAKESHIFT DEVICES FOR HANGERS OR SUPPORT

ELECTRICAL NOTES:

- CONTROL PANELS
- 1a) A CLASS "A" GROUND FAULT CIRCUIT INTERRUPTER MUST BE INSTALLED IN ALL BRANCH CIRCUITS SUPPLYING EQUIPMENT IN THE EQUIPMENT ROOM.
- 1b) THE NATIONAL ELECTRICAL CODE REQUIRES CLEAR SPACE AROUND INSTALLED ELECTRICAL PANELS FOR SAFETY AND MAINTENANCE THE INSTALLER SHALL VERIFY THAT EACH PANEL INSTALLATION IS COMPLIANT WITH THE N.E.C. AND LOCAL ELECTRICAL CODES.
- 2a) ALL METALLIC PIPING AND CONDUIT SYSTEMS ASSOCIATED WITH THE SPLASH PAD MUST BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR OF THE BRANCH CIRCUIT SUPPLYING ELECTRICAL POWER TO THE SPLASH PAD.
- 2b) ALL STAINLESS STEEL STRUCTURES REQUIRE BONDING PER NEC AND LOCAL CODES.
- 2c) ALL REQUIRED BONDING TO BE APPROVED BY LOCAL JURISDICTION INSPECTOR PRIOR TO PLACING CONCRETE
- GROUNDING
- 3a) THE FOLLOWING EQUIPMENT MUST BE GROUNDED: -ALL ELECTRICAL EQUIPMENT IN THE SPLASH PAD. -ALL ELECTRICAL RECIRCULATING SYSTEM EQUIPMENT. -ALL PANELBOARDS THAT SUPPLY ANY ELECTRICAL EQUIPMENT ASSOCIATED WITH THE SPLASH PAD.
- CONDUITS
- 4a) THE CONDUIT SYSTEM MUST BE WATERTIGHT FROM THE CONTROL PANEL TO THE WATER FEATURE/POOLS PRESSURE TEST CONDUIT WITH 5 PSI (MIN.) TO 15 PSI (MAX.), VERIFY WITH APPLICABLE CODES, FOR 30 MINUTES WITHOUT ANY PRESSURE DROP. IF REQUIRED REPAIR ANY LEAKS AND RE-TEST
- 4b) ALL CONDUITS EXPOSED TO MOISTURE MUST BE OF A CORROSION RESISTANT MATERIAL SUCH AS RED BRASS
- ALL ELECTRICAL WORK SHALL COMPLY WITH THE NFPA 70, NATIONAL ELECTRICAL CODE 2008 EDITION THAT IS INCORPORATED BY REFERENCE.

STORAGE TANK INSTALL INSTRUCTIONS:

- SITE CONDITIONS: THE SITE MUST BE ACCESSIBLE TO ARGE, HEAVY TRUCKS. FREE OF ITEMS LIKE TREES, OVERHEAD WIRES, AND BUILDINGS, THAT COULD INTERFERE WITH DELIVERY OR INSTALL ATION AND ALLOWS TRUCKS TO WITHIN 3 TO 8 FEET OF PLACEMENT **EXCAVATION**
- **EXCAVATION: EXCAVATION SHOULD BE APPROXIMATELY** 18" MINIMUM LARGER THAN TANK SIZE TO ALLOW FOR ADEQUATE BACK FILL. THIS MAY VARY WITH SOIL CONDITIONS EXCAVATION BELOW THE TANK CENTER TO BE 2" LOWER TO PREVENT UNDUE PRESSURE AT CENTER OF TANK.
- BEDDING: PROPER USE OF BEDDING MATERIAL IS MPORTANT TO ENSURE SERVICE LIFE OF TANK STRUCTURE. BEDDING MUST BE CAPABLE OF BEARING THE WEIGHT OF THE TANK AND CONTENTS. BEDDING MATERIAL SHALL HAVE THE ABILITY OF 100% TO BE ABLE TO PASS THROUGH A $\frac{1}{2}$ " SCREEN MADE UP OF SAND OR GRAVEL (CLEAN PEA STONE PREFERRED), BEDDING THICKNESS SHALL BE A 4" MINIMUM COMPACTED (THICKNESS MAY VARY WITH EXISTING SOIL CONDITIONS). THE CENTER BEDDING UNDER THE TANK SHOULD BE 1' LOWER THEN THE PERIMETER BEDDING.
- WATER TABLE: TANKS BEING PLACED WHERE WATER LEVELS CAN POTENTIALLY BE HIGHER THAN THE ELEVATION OF THE TANK COVER, MUST BE BROUGHT TO THE ATTENTION OF AQUATIX ADDITIONAL INSTALLATION\ INSTRUCTIONS SUCH AS BALLAST AND COATING MAY BE REQUIRED.
- BACKFILL: SIDEWALLS REQUIRE BACKFILL WHICH 100% SHALL PASS A 2" SCREEN MATERIAL MADE UP OF DRY SOIL, SAND, OR GRAVEL. MINIMUM 12" ALL SIDES OF THE TANK-FROM BASE TO TOP. NO PARALLEL BACKFILLING OR COMPACTION ALONG THE LENGTH OF SIDEWALLS IS PERMITTED. NO WHEEL OR TACK LOADING SIDEWALLS. MATERIAL ON TOP OF TANK TO PASS 4" SCREEN & DRY
- COVER MATERIAL: COVER MATERIAL SHALL BE DRY SOIL SAND, OR GRAVEL MATERIAL THAT HAS THE ABILITY OF 100% TO BE ABLE TO PASS THROUGH A 4" SCREEN. COVER MATERIALS SHALL BE MOUNDED OVER TANK AND AROUND RISERS TO DIRECT RUN-OFF AWAY FROM STORAGE TANK
- WATER EVACUATE: FILTRATION PUMP MAY BE USED TO EVACUATE WATER FROM STORAGE TANK TO APPROVED WASTE CONNECTION IN EVENT OF WATER CONTAMINATION, TANK SHALL BE THOROUGHLY CLEANED AND SANITIZED PRIOR TO RE-FILLING, CONFIRM INSPECTION WITH YOUR LOCAL HEALTH DEPARTMENT RE-FILLING STORAGE TANK & RE-STARTING THE SYSTEM.
- TANK STANDARD: TANK TO BE MANUFACTURED TO ASTM C-913 AND C-1227 STANDARDS. ALL SEAMS AND PIPE PENTRATIONS TO BE WATER TIGHT.

CONCRETE NOTES:

- CAST IN PLACE CONCRETE NOTES:
- DESIGN CODE: ACI 318 LATEST EDITION. VERIFY LOCAL/STATE CODES FOR TYPE, THICKNESS. &
- REINFORCEMENT REQUIREMENTS FOR CONCRETE SLAB.
- MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS: TYPE STRENGTH LOCATION
 - Fc'=3,000PSI FOOTINGS Fc'=4,000PSI POOL SLABS WALL, AND EXTERIOR CONCRETE EXPOSED TO FREEZING
 - TEMPS W/5% TO 7% AIR ENTRAINMENT.
- 4. REINFORCING STEEL:
- 4a) DEFORMED BARS-ASTM A615 GRADE 60KSI
- 5. PLACE ALL ITEMS PER APPROVED SHOP DWGS. AND APPROVED CONCRETE MIX DESIGNS.
- PROVIDE CONCRETE COVER PER ACI 318.
- ALL CONCRETE SURFACES TO HAVE A MEDIUM BROOM FINISH

GENERAL FOUNDATION AND CAST IN PLACE CONCRETE

- 1. DESIGN CODES ACI 318 AND "ACI DETAILING MANUAL". LATEST EDITION.
- 2. ALL FOOTINGS ARE CENTERED UNDER WALLS ABOVE,
- 3. ALL FOOTING ELEVATIONS SHOWN ARE TO TOP OF FOOTING
- 4. PROVIDE ALL ACCESSORIES AND SUPPORTS NECESSARY TO SECURE REINFORCING STEEL PER "ACI DETAILING MANUAL" NO OTHER METHODS OR MATERIALS WILL BE ACCEPTABLE
- PROVIDE PLASTIC CHAIRS AND BAR SUPPORTS IN ALL AREAS OF EXPOSED CONCRETE.
- 6. PROVIDE CONCRETE PROTECTION FOR ALL REINFORCEMENT AS PER ACI 318, SECTION 7.7 REQUIREMENTS FOR CAST IN PLACE CONCRETE:
- 6a) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3" 6b) CONCRETE EXPOSED TO EARTH OR WEATHER:
- #5 BARS AND SMALLER: 11/2" #6 BARS AND LARGER: 2" 6c) CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: SLABS, WALLS, AND
- JOISTS (#3 TO #11 BARS): 3/4" BEAMS, GIRDERS AND COLUMNS, PRIMARY REINFORCEMENT, TIES, STIRRUPS OR SPIRALS: 11/2" CROSS REFERENCE AQUATIXH. AND STRUCTURAL DWGS. TO ENSURE CORRECT LOCATIONS AND PLACEMENT OF
- ALL ANCHOR BOLTS, INSERTS, ETC. CAST DOWELS IN FTG. FOR CONCRETE WALLS ABOVE. DOWELS TO BE SAME QTY. SIZE AND SPA. AS THE VERT. WALL REINFORCEMENT. DOWELS ARE TO PROJECT FROM FTGS. TO PROVIDE THE LAP SPLICES INDICATED BELOW, U.N.O. PROVIDE 90° STANDARD HOOK IN FREE STANDING WALL FTG. DOWELS. WALL
- ETG DOWELS ARE STRAIGHT UNO 9. ALL HORIZONTAL REINFORCING BARS AT OUTSIDE FACE OF WALLS SHALL BE BENT AT WALL CORNERS OR AT INTERSECTING WALLS AND SHALL LAP TO INTERSECTING REINFORCING AS INDICATED BELOW. SEPARATE BENT BAR DOWELS OF THE SAME SIZE AND SPA AS THE HORIZONTAL WALL REINFORCING AND LAPPED AS INDICATED BELOW MAY BE USED INSTEAD.
- 10. LAP SPLICES AT ALL REINFORCING IN ALL CAST IN PLACE CONCRETE SHALL BE AS FOLLOW, U.N.O. #4 BAR=24" #7 BAR=42" #5 BAR=30" #8 BAR=48" #6 BAR=36" #9 BAR=54"
- UNLESS NOTED OTHERWISE ON DWGS. PROVIDE ADDITIONAL REINFORCING ALL AROUND CONCRETE WALL AND SLAB OPENINGS EQUAL TO THE INTERRUPTED REINFORCING IN EACH DIRECTION AND EACH FACE MIN. ONE (1) BAR ALL AROUND FOR EACH LAYER OF REINFORCING). EXTEND BARS BEYOND EDGE OF OPENINGS EQUAL TO LAP LENGTH INDICATED ABOVE. ADD ONE (1) #4x4'-0" DIAG. BAR CENTERED ON EACH CORNER (ONE (1) PER EACH LAYER OF REINFORCEMENT).
- EXPANSION JOINT TO BE EVERY 20' x 20'
- 13. SAW CUT JOINT TO BE EVERY 10' x 10'. 14. ALL CONCRETE SURFACES TO HAVE A MEDIUM BROOM FINISH.



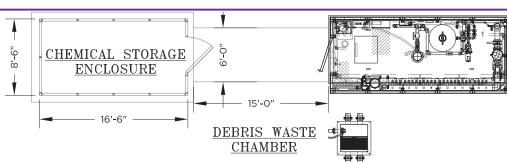




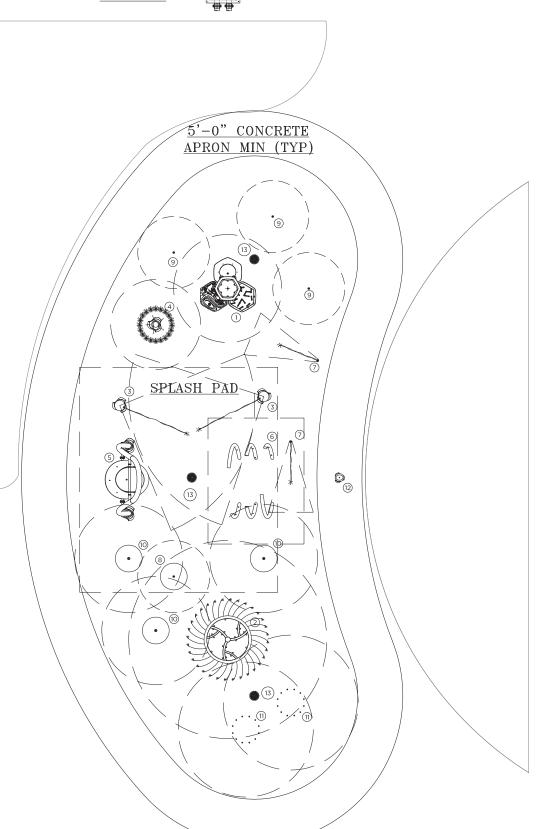


SITE PLAN LAYOUT

3/32"=1'-0"



MECH20 EQUIPMENT ENCLOSURE AND STORAGE TANK



NO	PRODUCT	QTY	LINE SIZE	GPM
1	AQUAGATHER	1	1"	10
2	HYDROHELIX W/ACRYLIC	1	2"	30
3	HYDROSPHERE	2	1" EA	5EA
4	SPRAYSHROUD	1	1 ½"	30
5	VERSOSPLASH	1	1 ½"	20
6	WHILFLEX	1	1 ½"	30
7	ARCH JET	2	1" EA	10EA
8	FUNNEL TWIST	1	1"	5
9	GROUND FUNNEL	3	1" EA	10EA
10	JR WATER JEWEL	3	1" EA	7EA
11	MINI UPWARD SPRAY RING	2	2 ½"EA	60EA
12	AQUAVATOR	1	-	
13	COLLECTOR BOX	2		

- 1. ALL CONCRETE SLOPES TO BE \%"/FT MIN. AND
- 2. SITE ELEVATIONS OF SPLASH PAD AND CONCRETE APRON TO BE VERIFIED BY OTHERS
- SURFACE MOUNTED STRUCTURES MAY REQUIRE A FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING INSTALLATION INSTRUCTIONS.
- ACTUAL SIZE, SHAPE, AND LOCATION OF SPLASH PAD TO BE FIELD DETERMINED BY OTHERS. ALL DIMENSIONS OF SIZE AND SHAPE OF SPLASH PAD FOR REFERENCE ONLY.
- INDICATES SAW CUT JOINT
 INDICATES EXPANSION JOINT
 THE INTENT OF A SPLASH PAD IS TO BE A DRY DECK WITH NO STANDING WATER. THE WATER IS TO BE CONTAINED WITHIN THE PERIMETER OF THE SPLASH PAD AND ALL WATER IS TO DRAIN INTO THE DRAINAGE BOX. THE CONCRETE IS TO BE FORMED AND SLOPED TO ACCOMMODATE THIS DRAIN PATTERN.
- 8. UNDER NO CIRCUMSTANCES SHALL THE SURROUNDING HARDSCAPE AREA BE SLOPED TO ALLOW WATER TO BE DRAINED INTO THE SPLASH
- 9. ALL CONCRETE SURFACES TO HAVE A MEDIUM
- BROOM FINISH.

 10. SUB-CUT EXCAVATION UNDER SPLASH PAD 18" MIN FOR GRANULAR FILL.
- EXPANSION JOINT TO BE EVERY 20'x20'.
- 12. SAW CUT JOINT TO BE EVERY 10'x10'.
- 13. COORDINATE EXPANSION JOINT AND SAW CUT LOCATIONS WITH PLAY EQUIPMENT LOCATIONS.
- 14. SEE SHEET 4 OF 12 FOR SPLASH PAD LAYOUT.
 15. SEE SHEET 5 OF 12 FOR CONCRETE LAYOUT.
 16. DRAWINGS ARE FOR DESIGN/LAYOUT PURPOSES ONLY. PLEASE SEE AQUATIC RECREATION COMPANY PROPOSAL FOR INCLUDED STRUCTURES, EQUIPMENT, SERVICES, AND EXCLUSIONS.
- — INDICATES SPLASH ZONE.
- 18. SPLASH ZONES ARE APPROXIMATE. ACTUAL SPLASH ZONE MAY VARY BASED ON VARIOUS ENVIRONMENTAL CONDITIONS, FLOW RATES, SLOPE OF THE SPLASH PAD, SUBMERGENCE DEPTH AND WIND.

SITE LAYOUT ASSUMES NO STRONG PREVAILING WINDS FROM ANY SPECIFIC DIRECTION. PLEASE ADVISE AQUATIX AS SOON AS POSSIBLE IF WIND CONDITIONS MAY EFFECT PRODUCT SPRAY ZONES.

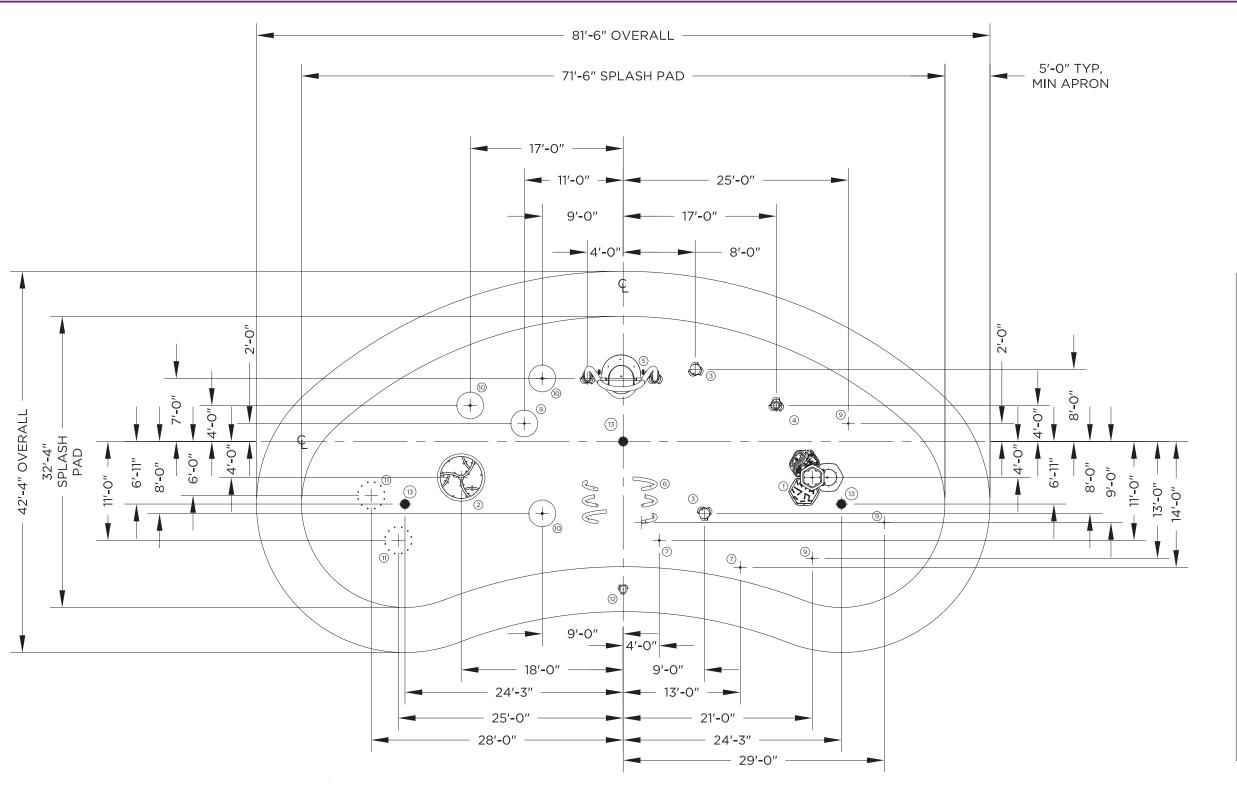


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1	GEORGE	1
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JOB NO 1175457





-		_		
NO	PRODUCT	QTY	LINE SIZE	GPM
1	AQUAGATHER	1	1"	10
2	HYDROHELIX W/ACRYLIC	1	2"	30
3	HYDROSPHERE	2	1" EA	5EA
4	SPRAYSHROUD	1	1 ½"	30
5	VERSOSPLASH	1	1 ½"	20
6	WHILFLEX	1	1 ½"	30
7	ARCH JET	2	1" EA	10EA
8	FUNNEL TWIST	1	1"	5
9	GROUND FUNNEL	3	1" EA	10EA
10	JR WATER JEWEL	3	1" EA	7EA
11	MINI UPWARD SPRAY RING	2	2 ½"EA	60EA
12	AQUAVATOR	1	-	
13	COLLECTOR BOX	2		

- 1. ALL CONCRETE SLOPES TO BE 1/8"/FT MIN. AND
- SITE ELEVATIONS OF SPLASH PAD AND CONCRETE
- FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING
- PAD TO BE FIELD DETERMINED BY OTHERS. ALL DIMENSIONS OF SIZE AND SHAPE OF SPLASH PAD FOR REFERENCE ONLY.

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- ALLOW WATER TO BE DRAINED INTO THE SPLASH PAD DECK.
- BROOM FINISH.
- 10. SUB-CUT EXCAVATION UNDER SPLASH PAD 18" MIN
- 12. SAW CUT JOINT TO BE EVERY 10'x10'.
- LOCATIONS WITH PLAY EQUIPMENT LOCATIONS.
- 14. SEE SHEET 4 OF 12 FOR SPLASH PAD LAYOUT. 15. SEE SHEET 5 OF 12 FOR CONCRETE LAYOUT.
- 16. DRAWINGS ARE FOR DESIGN/LAYOUT PURPOSES ONLY. PLEASE SEE AQUATIC RECREATION COMPANY PROPOSAL FOR INCLUDED STRUCTURES,
- EQUIPMENT, SERVICES, AND EXCLUSIONS. — — INDICATES SPLASH ZONE.
- 18. SPLASH ZONES ARE APPROXIMATE. ACTUAL SPLASH ZONE MAY VARY BASED ON VARIOUS

PRODUCT	QIY	LINE SIZE	GPM	1	4	1	7	5
AQUAGATHER	1	1"	10	i	á	12/19/2	1/17/2	5/14/2
HYDROHELIX W/ACRYLIC	1	2"	30	╟	+		_	H
HYDROSPHERE	2	1" EA	5EA					
SPRAYSHROUD	1	1 ½"	30					
VERSOSPLASH	1	1 ½"	20				UP	
WHILFLEX	1	1 ½"	30				MARKUP	
ARCH JET	2	1" EA	10EA					
FUNNEL TWIST	1	1"	5				STAL	
GROUND FUNNEL	3	1" EA	10EA				Z Z	REVIEW
JR WATER JEWEL	3	1" EA	7EA				PE N	
MINI UPWARD SPRAY RING	2	2 ½"EA	60EA			٦Ľ	3 PLA	HEAI TH
AQUAVATOR	1					APPROVAL	PIPING PLAN PER INSTALLER	
COLLECTOR BOX	2					APPI		STATE
				֓֟֟֝֟֝֟֝֟֝֓֓֓֓֓֓֓֓֓֟	200	ASE FOR,	ED SUPPLY	FD PFR

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1/4"/FT MAX.

APRON TO BE VERIFIED BY OTHERS.
SURFACE MOUNTED STRUCTURES MAY REQUIRE A

INSTALLATION INSTRUCTIONS. ACTUAL SIZE, SHAPE, AND LOCATION OF SPLASH

— INDICATES SAW CUT JOINT

INDICATES EXPANSION JOINT
THE INTENT OF A SPLASH PAD IS TO BE A DRY DECK WITH NO STANDING WATER. THE WATER IS TO BE CONTAINED WITHIN THE PERIMETER OF THE SPLASH PAD AND ALL WATER IS TO DRAIN INTO THE DRAINAGE BOX. THE CONCRETE IS TO BE FORMED AND SLOPED TO ACCOMMODATE

THIS DRAIN PATTERN.
UNDER NO CIRCUMSTANCES SHALL THE
SURROUNDING HARDSCAPE AREA BE SLOPED TO

ALL CONCRETE SURFACES TO HAVE A MEDIUM

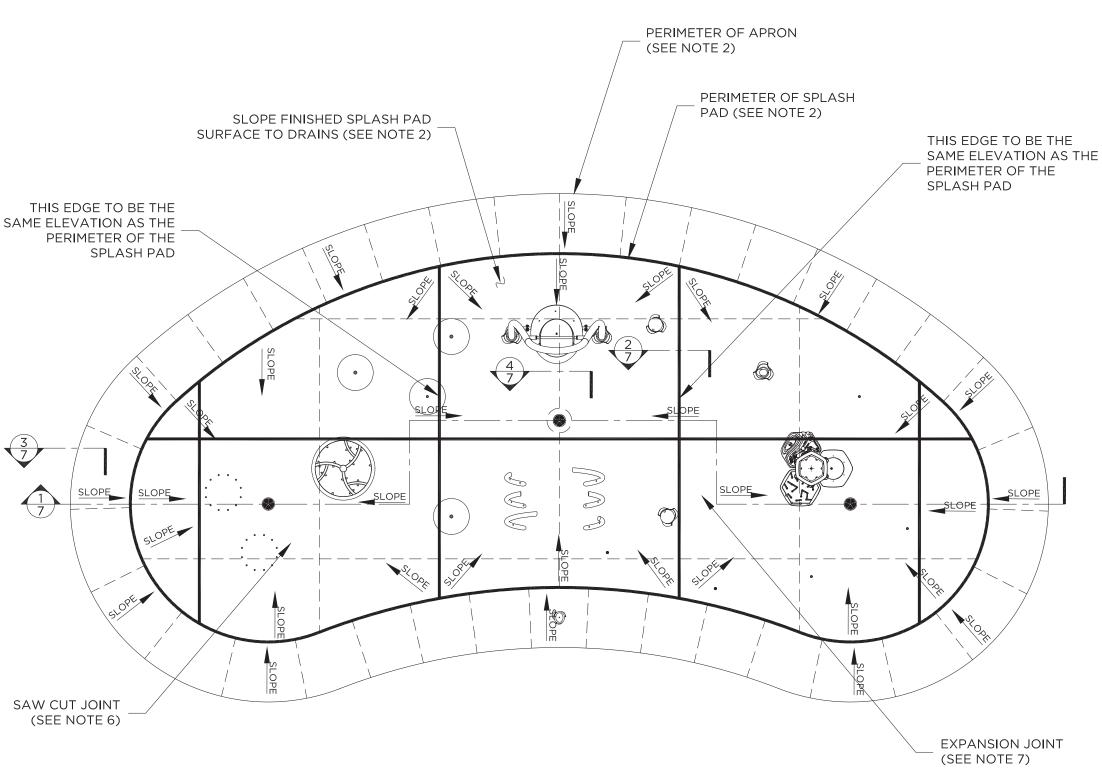
FOR GRANULAR FILL. EXPANSION JOINT TO BE EVERY 20'x20'.

13. COORDINATE EXPANSION JOINT AND SAW CUT

ENVIRONMENTAL CONDITIONS, FLOW RATES, SLOPE OF THE SPLASH PAD, SUBMERGENCE DEPTH AND WIND.







- 1. ALL CONCRETE SLOPES TO BE 1/8"/FT MIN. AND
- 2. SITE ELEVATIONS OF SPLASH PAD AND CONCRETE APRON TO BE VERIFIED BY OTHERS
- 3. SURFACE MOUNTED STRUCTURES MAY REQUIRE A FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING INSTALLATION INSTRUCTIONS.
- 4. REFER TO SPEC SHEET AND INSTALLATION DRAWING
- FOR EACH PRODUCT.

 5. ACTUAL SIZE, SHAPE, AND LOCATION OF SPLASH PAD TO BE FIELD DETERMINED BY OTHERS. ALL DIMENSIONS OF SIZE AND SHAPE OF SPLASH PAD FOR REFERENCE

- INDICATES SAW CUT JOINT
 INDICATES EXPANSION JOINT
 THE INTENT OF A SPLASH PAD IS TO BE A DRY DECK WITH NO STANDING WATER. THE WATER IS TO BE CONTAINED WITHIN THE PERIMETER OF THE SPLASH PAD AND ALL WATER IS TO DRAIN INTO THE COLLECTOR BOX(S). THE CONCRETE IS TO BE FORMED AND SLOPED TO ACCOMMODATE THIS DRAIN PATTERN.
- ALL TREATED SPLASH PAD WATER IS INTENDED TO REMAIN WITHIN DESIGNATED SPLASH PAD DECK. UNDER NO CIRCUMSTANCES SHOULD SLOPE OF SPLASH PAD ALLOW WATER TO DRAIN OFF PAD
- 10. UNDER NO CIRCUMSTANCES SHALL THE SURROUNDING HARDSCAPE AREA BE SLOPED TO ALLOW WATER TO BE DRAINED INTO THE SPLASH PAD DECK
- 11. ALL CONCRETE SURFACES TO HAVE A MEDIUM BROOM FINISH
- 12. SUB-CUT EXCAVATION UNDER SPLASH PAD 18" MIN FOR GRANULAR FILL
- 13. EXPANSION JOINT TO BE EVERY 20'x20'.
- 14. SAW CUT JOINT TO BE EVERY 10'x10'.
- 15. COORDINATE EXPANSION JOINT AND SAW CUT LOCATIONS WITH PLAY EQUIPMENT LOCATIONS.

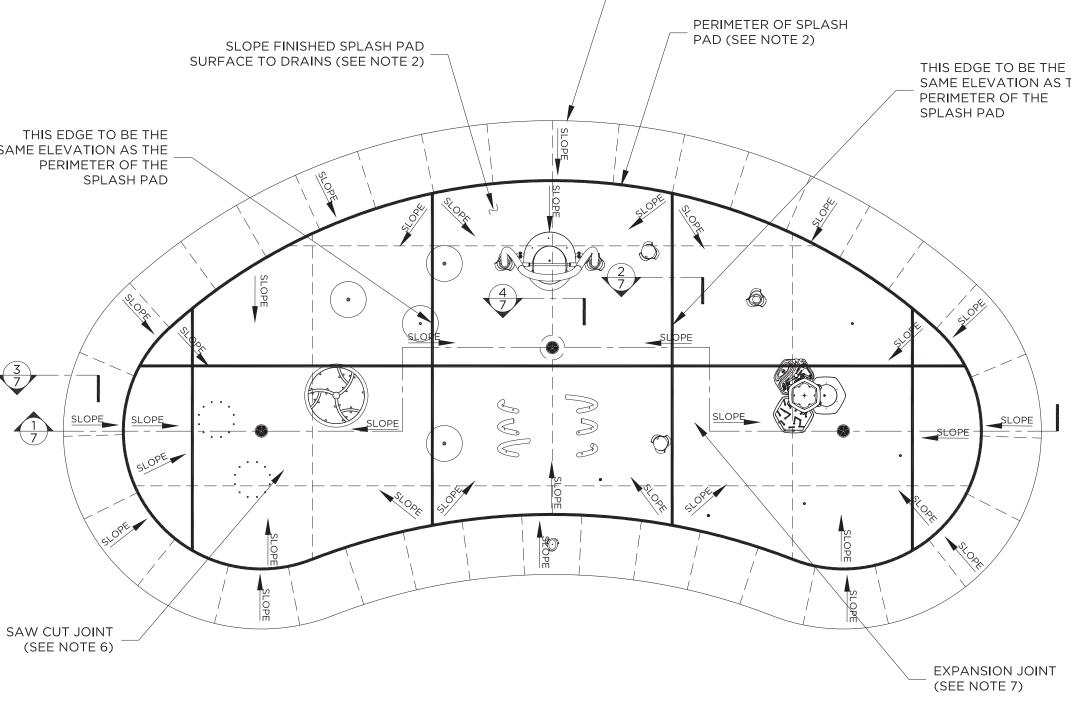
SEE PAGE 7 OF 12 FOR SECTION DETAILS

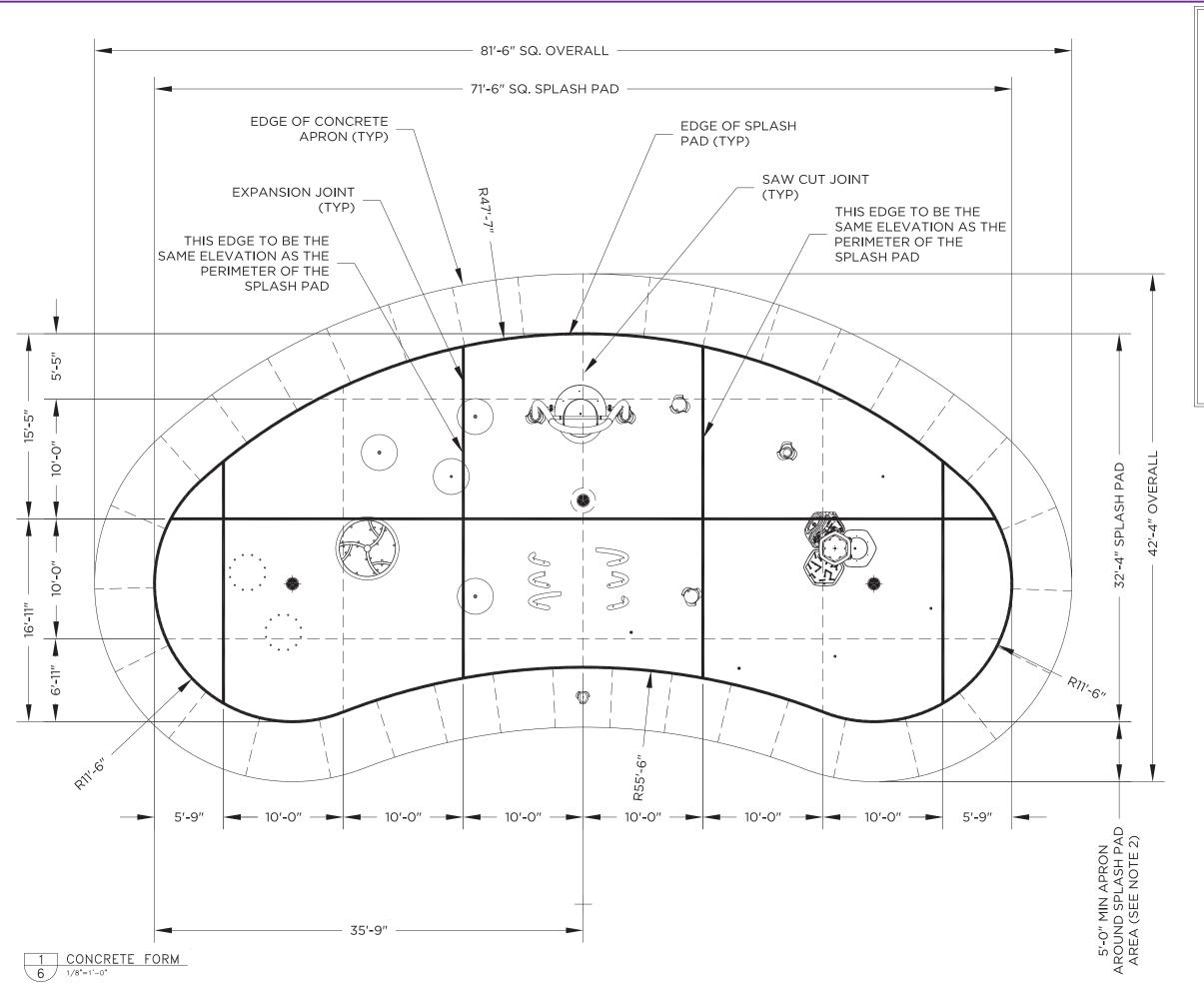
IMPORTANT: SEE NOTE #8 CONCERNING SPLASH PAD SLOPE

Ö	REVISION	۵
∢	RELEASE FOR APPROVAL	12/
В	REVISED SUPPLY PIPING PLAN PER INSTALLER MARKUP	/
υ	REVISED PER STATE HEALTH REVIEW	3/

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E. MIKS





- 1. ALL CONCRETE SLOPES TO BE 1/8"/FT MIN. AND
- 2. SITE ELEVATIONS OF SPLASH PAD AND CONCRETE APRON TO BE VERIFIED BY OTHERS
- 3. SURFACE MOUNTED STRUCTURES MAY REQUIRE A FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING INSTALLATION INSTRUCTIONS.
- 4. REFER TO SPEC SHEET AND INSTALLATION DRAWING
- FOR EACH PRODUCT.

 5. ACTUAL SIZE, SHAPE, AND LOCATION OF SPLASH PAD TO BE FIELD DETERMINED BY OTHERS. ALL DIMENSIONS OF SIZE AND SHAPE OF SPLASH PAD FOR REFERENCE
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- ALL TREATED SPLASH PAD WATER IS INTENDED TO REMAIN WITHIN DESIGNATED SPLASH PAD DECK. UNDER NO CIRCUMSTANCES SHOULD SLOPE OF SPLASH PAD ALLOW WATER TO DRAIN OFF PAD
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- 14. SAW CUT JOINT TO BE EVERY 10'x10'.
- 15. COORDINATE EXPANSION JOINT AND SAW CUT LOCATIONS WITH PLAY EQUIPMENT LOCATIONS.

SEE PAGE 7 OF 12 FOR SECTION DETAILS

IMPORTANT: SEE NOTE #8 CONCERNING SPLASH PAD SLOPE

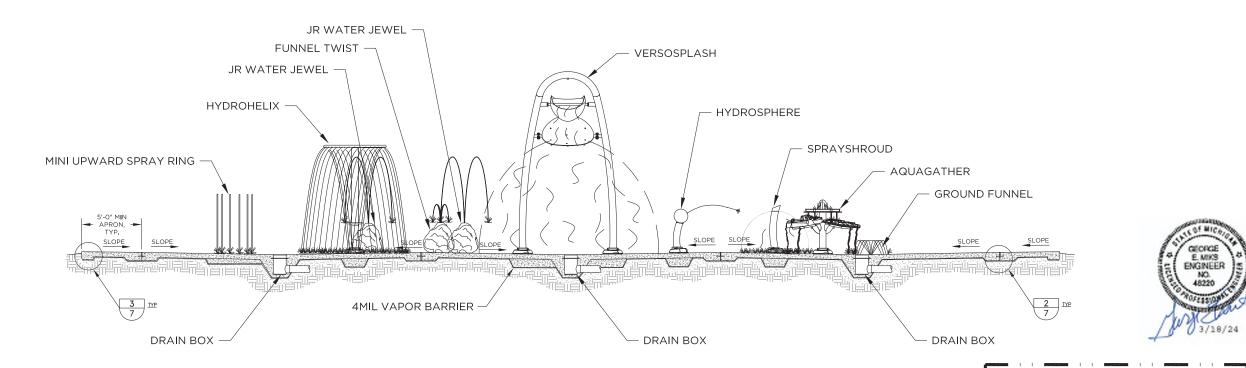


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NOTE:

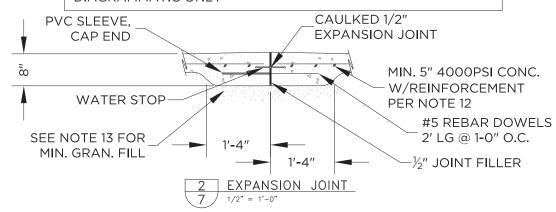
- 1. ALL SUB-BASE MATERIALS BY OTHERS, CONTRACTOR CAN ASSUME SITE TO BE LEVEL TO ROUGH GRADE WITH COMPACTED FILL, COMPACTION TEST BY OTHERS.
- 2. CONCRETE TO BE THICKENED AT ALL PRODUCT INSTALLATION LOCATIONS (BOTH EMBED AND ABOVE GROUND STRUCTURES), REFER TO INSTALLATION DRAWINGS FOR EACH PRODUCT.
- 3. ALL CONCRETE SLOPES TO BE 1/8"/FT MIN.
- 4. SITE ELEVATIONS OF SPLASH PAD AND CONCRETE APRON TO BE VERIFIED BY OTHERS. AQUATIX™ ELEVATION REFERENCE IS 0.00 FOR TOP OF COLLECTOR BOX AND TOP OF GRADE AT UNDERGROUND STORAGE TANK.
- 5. ACTUAL SIZE, SHAPE, AND LOCATION OF SPLASH PAD TO BE FIELD DETERMINED BY OTHERS, ALL DIMENSIONS OF SIZE AND SHAPE OF SPLASH PAD FOR REFERENCE ONLY.
- 6. THE INTENT OF A SPLASH PAD IS TO BE A DRY DECK WITH NO STANDING WATER. THE WATER IS TO BE CONTAINED WITHIN THE PERIMETER OF THE SPLASH PAD AND ALL WATER IS TO DRAIN INTO COLLECTOR BOX. THE CONCRETE IS TO BE FORMED AND SLOPED TO ACCOMMODATE THE DRAIN PATTERN.
- 7. ALL TREATED SPLASH PAD WATER IS INTENDED TO REMAIN WITHIN DESIGNATED SPLASH PAD DECK. UNDER NO CIRCUMSTANCES SHOULD SLOPE OF SPLASH PAD OR SLOPE OF SURROUNDING AREA ALLOW WATER TO DRAIN OFF PAD.

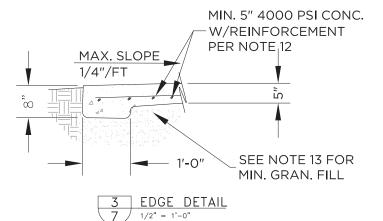
- NOTE: (CONTINUED)
- 8. UNDER NO CIRCUMSTANCES SHALL THE SURROUNDING HARDSCAPE AREA BE SLOPED TO ALLOW WATER TO BE DRAINED INTO THE SPLASH
- 9. ALL CONCRETE SURFACES TO HAVE A MEDIUM BROOM FINISH.
- 10, COORDINATE EXACT LOCATION OF SAW CUTS AND EXPANSION JOINTS WITH PLAY EQUIPMENT LOCATIONS.
- 11. VERIFY LOCAL/STATE CODES FOR TYPE, THICKNESS, & REINFORCEMENT REQUIREMENTS FOR CONCRETE SLAB.
- 12. CONCRETE REINFORCEMENT TO BE #4 REBAR @ 12" O.C. EACH WAY OR EQUIVALENT WELDED WIRE MESH (W6 ON 4"X4" SPACING OR W10 ON 6"X6" SPACING)
- 13. 18" OF GRANULAR FILL RECOMMENDED, OR AS SOIL CONDITIONS AND/OR LOCAL CODE REQUIRES WITH A MINIMUM OF 2500 PSF SOIL BEARING
- 14. THERE IS TO BE A MINIMUM OF 6" OF GRANULAR FILL AROUND ALL PIPING



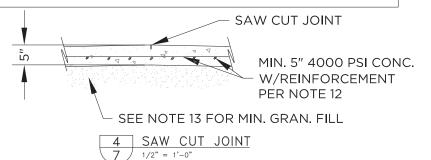












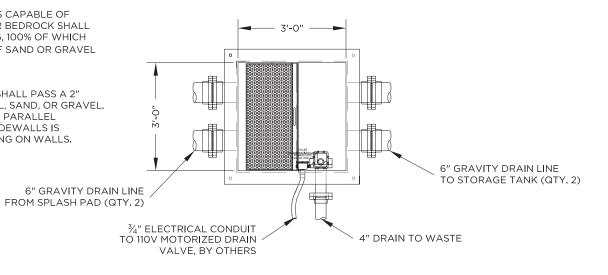
SEE PAGE 5 OF 12 FOR

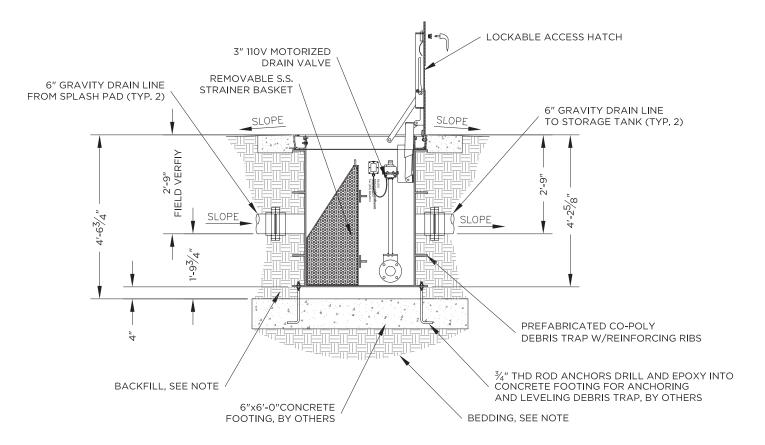
LOCATIONS OF DETAILS



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WALLS REQUIRE BACKFILL WHICH 100% SHALL PASS A 2" SCREEN. MATERIAL MADE UP OF DRY SOIL, SAND, OR GRAVEL.
MINIUM OF 12" ON ALL SIDES OF TRAP. NO PARALLEL BACKFILLING OR COMPACTION ALONG SIDEWALLS IS PERMITTED. NO WHEEL OR TRACK LOADING ON WALLS.



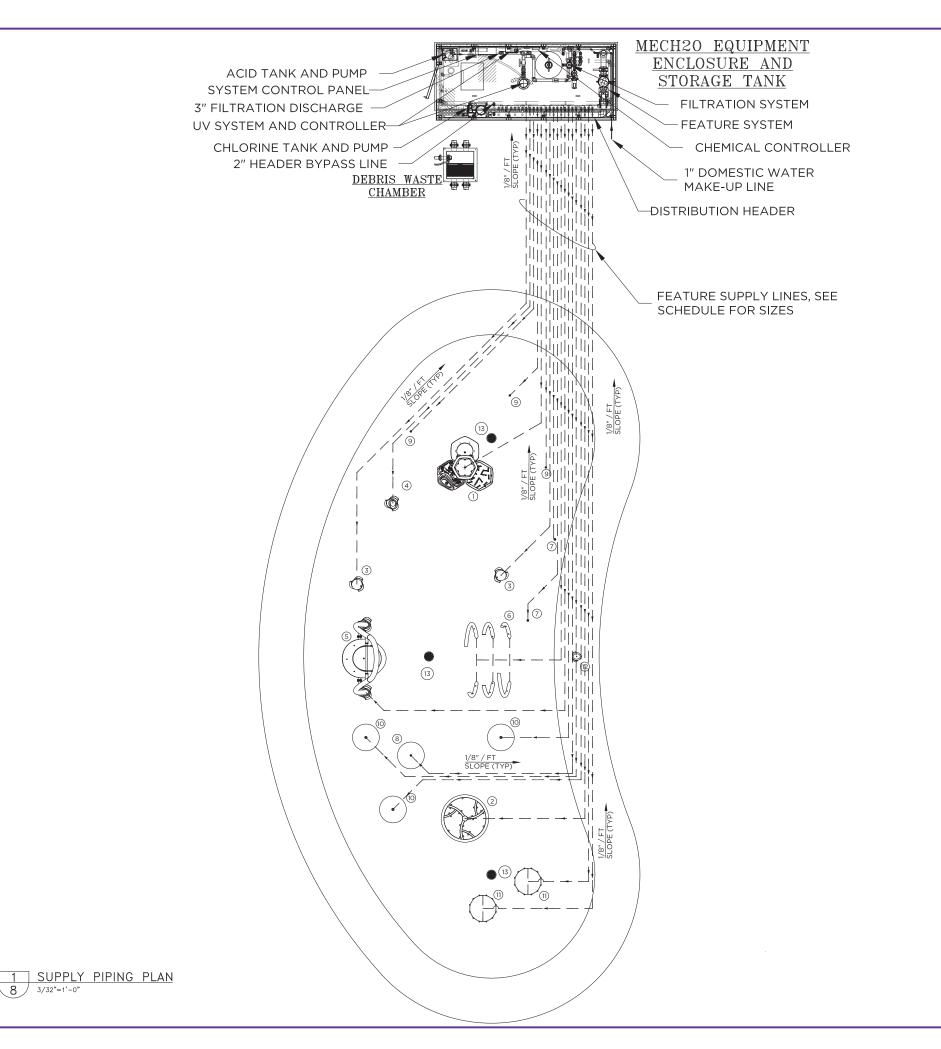


2 DEBRIS TRAP/DRAIN TO WASTE 7-2 3/8" = 1'-0"









8 3/32"=1'-0"

NO	PRODUCT	QTY	LINE SIZE	GPM
1	AQUAGATHER	1	1"	10
2	HYDROHELIX W/ACRYLIC	1	2"	30
3	HYDROSPHERE	2	1" EA	5EA
4	SPRAYSHROUD	1	1 ½"	30
5	VERSOSPLASH	1	1 ½"	20
6	WHILFLEX	1	1 ½"	30
7	ARCH JET	2	1" EA	10EA
8	FUNNEL TWIST	1	1"	5
9	GROUND FUNNEL	3	1" EA	10EA
10	JR WATER JEWEL	3	1" EA	7EA
11	MINI UPWARD SPRAY RING	2	2 ½"EA	60EA
12	AQUAVATOR	1		
13	COLLECTOR BOX	2		

- 1. ALL SUPPLY AND DRAIN LINES TO SLOPE

 %"/FT AWAY FROM SPLASH PAD.

 2. GRAVITY DRAIN LINE VELOCITY NOT TO

 EXCEED 3.0 FT/SEC.
- SURFACE MOUNTED STRUCTURES MAY REQUIRE A FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING INSTALLATION INSTRUCTIONS.
- ALL PIPING SHOULD BE SCH 80 PVC.
- 5. ALL LINES FROM PIPE MANIFOLDS TO FEATURES SHOULD NOT BE CROSSED.
 6. ANY REQUIRED BACKFLOW DEVICE OR WATER METER ON THE CITY WATER MAIN
- SHALL BE PROVIDED BY OWNER. EXACT ROUTING OF PIPING TO BE DETERMINED BY INSTALLING CONTRACTOR.
- 8. INCOMING FRESH WATER SUPPLY TO BE PROVIDED WITH AN APPROVED REGULATOR SET TO 25-30PSI IN ACCORDANCE WITH LOCAL AND STATE CODES.

(VERIFY LINE SIZE W/ MUNICIPALITY PRIOR TO CONSTRUCTION.)

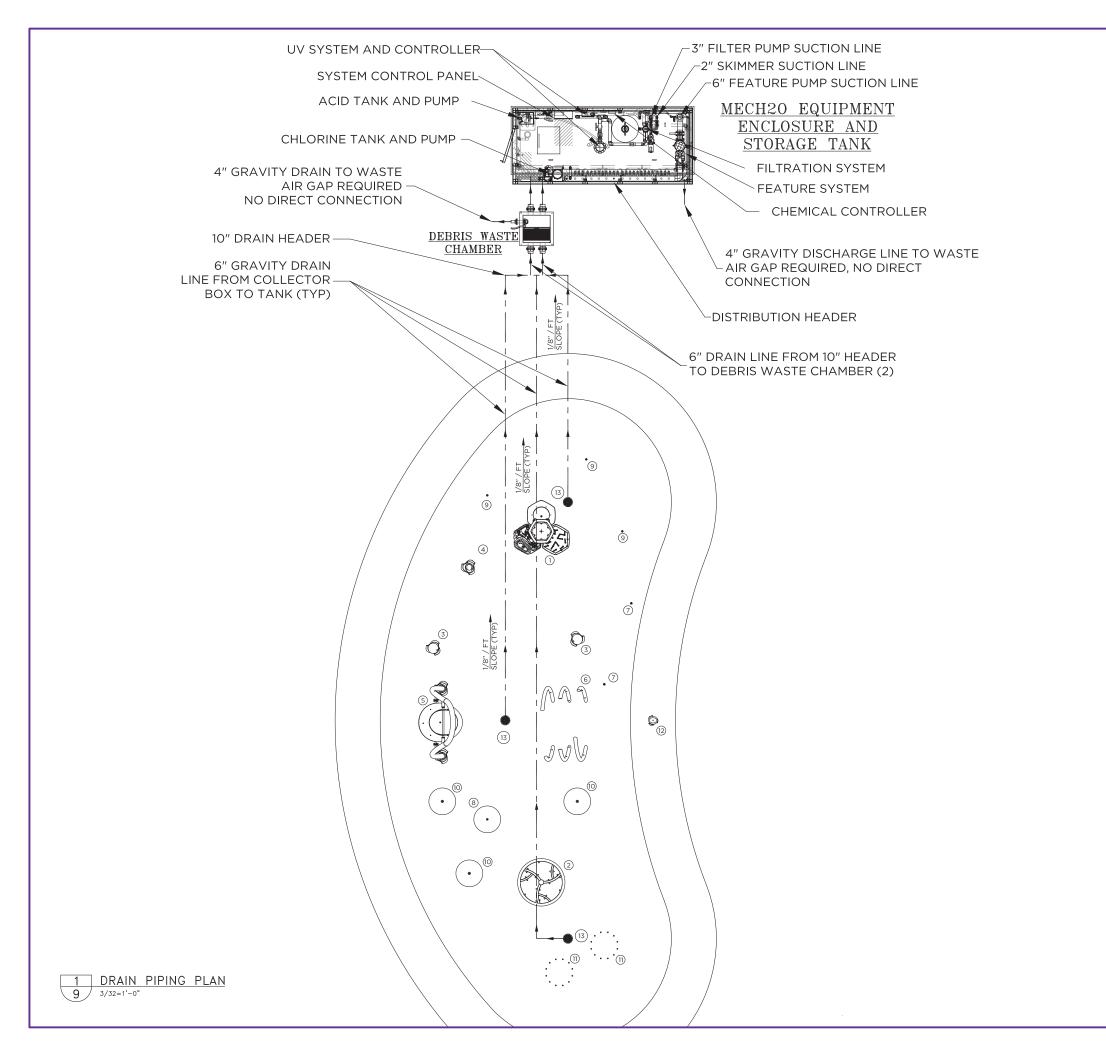
	LEGEND
	SUPPLY LINE
	DRAIN LINE
	SUCTION LINE
	ELECTRICAL CONDUIT
\bowtie	MANUAL VALVE
	FLOW DIRECTION
	ACTUATED VALVE

		₹	
CHECKED		SUPPLY PIPING PLA	
DRAWN	CTS	SUPPL	
SCALE	AS NOTED		

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	GEORGE E.MIKS
FISCO	ENGINEER S NO. 48220
,	1011300 A
1	3/18/24

JOB NO 1175457

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NO	PRODUCT	QTY	LINE SIZE	GPM
1	AQUAGATHER	1	1"	10
2	HYDROHELIX W/ACRYLIC	1	2"	30
3	HYDROSPHERE	2	1" EA	5EA
4	SPRAYSHROUD	1	1 ½"	30
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10	JR WATER JEWEL	3	1" EA	7EA
11	MINI UPWARD SPRAY RING	2	2 ½"EA	60EA
12	AQUAVATOR	1		
13	COLLECTOR BOX	2		

- ALL SUPPLY AND DRAIN LINES TO SLOPE 1/8"/FT AWAY FROM SPLASH PAD.
- 2. GRAVITY DRAIN LINE VELOCITY NOT TO EXCEED 3.0 FT/SEC.
- 3. SURFACE MOUNTED STRUCTURES MAY REQUIRE A FLAT/LEVEL SURFACE FOR PROPER INSTALLATION. SEE INDIVIDUAL STRUCTURE MOUNTING INSTALLATION INSTRUCTIONS.
- ALL PIPING SHOULD BE SCH 80 PVC.
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- ANY REQUIRED BACKFLOW DEVICE OR WATER METER ON THE CITY WATER MAIN SHALL BE PROVIDED BY OWNER. EXACT ROUTING OF PIPING TO BE
- DETERMINED BY INSTALLING CONTRACTOR.
- INCOMING FRESH WATER SUPPLY TO BE PROVIDED WITH AN APPROVED REGULATOR SET TO 25-30PSI IN ACCORDANCE WITH LOCAL AND STATE CODES.
 (VERIFY LINE SIZE W/ MUNICIPALITY PRIOR TO CONSTRUCTION.)

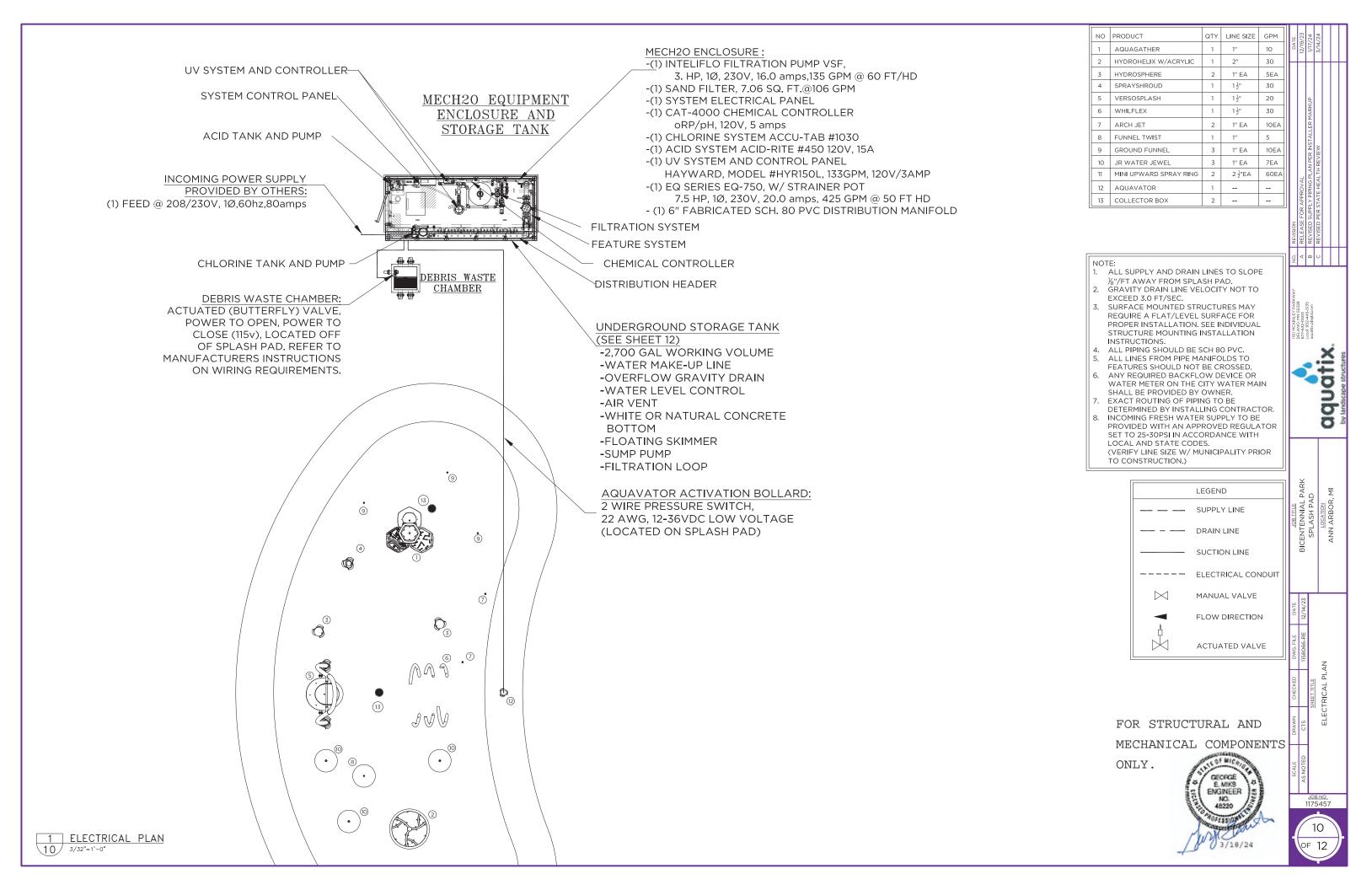
LEGEND
SUPPLY LINE
DRAIN LINE
SUCTION LINE
ELECTRICAL CONDUIT
MANUAL VALVE
FLOW DIRECTION
ACTUATED VALVE

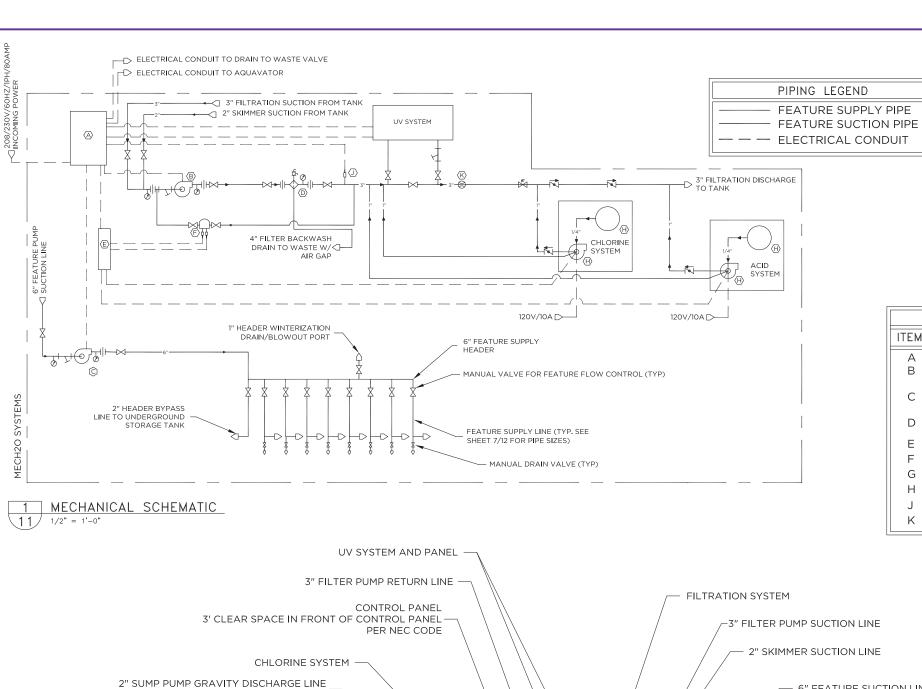
DRAWN CHECKED DWG.FILE DA CTS 1158066-RE 12/1			SHEET TITLE	0,1	
CHECKED DWG, FILE	12/1	1158066-RE		CTS	
	ΔQ	DWG. FILE	CHECKED	DRAWN	

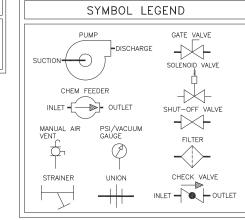
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	FEATURE EQUIPMENT	
ITEM#	DESCRIPTION: TOTAL Q	ΤY
Α	MAIN CONTROL PANEL	1
В	3HP 230/60/1PH FILTRATION PUMP W/ STRAINER	1
С	7.5HP 230/60/1PH FEATURE PUMP W/ STRAINER	1
D	SAND FILTER W/ MULTIPORT VALVE	1
Е	PH/ORP CONTROLLER	1
F	PH/ORP PROBES	1
G	CHLORINE SYSTEM	1
Н	Ph SYSTEM	1
J	FLOW SWITCH	1
K	FLOW METER	1

- 1. ALL GRAVITY DRAIN LINES TO SLOPE 1/8"/FT AWAY FROM SPLASH PAD.
 2. GRAVITY DRAIN LINE VELOCITY NOT TO EXCEED 3.0 FT/SEC.
 3. REFER TO SPEC SHEET AND INSTALLATION DRAWING FOR EACH
- PRODUCT.

 A LOCATION AND SIZE OF UNDERGROUND STORAGE TANK NOT TO SCALE.

 5. ALL PIPING BETWEEN COLLECTOR BOXES, UNDERGROUND STORAGE
 TANK, AND OPERATING SYSTEM SHOULD BE SCH 80 PVC.

 6. ALL LINES FROM PIPE MANIFOLDS TO FEATURES SHOULD NOT BE
 CROSSED.

 7. ANY REQUIRED BACKFLOW DEVICE OR WATER METER ON THE CITY
 WATER MAIN SHALL BE PROVIDED BY OTHERS.

 8. EXACT ROUTING OF PIPING TO BE DETERMINED BY CONTRACTOR.

 9. UNDERGROUND STORAGE TANK AND ALL EQUIPMENT MUST BE SECURE
 TO PEPUP TURNAL THORIZED ACCESS.

- TO PREVENT UNAUTHORIZED ACCESS.

 10. ✓INDICATES FLOW DIRECTION.

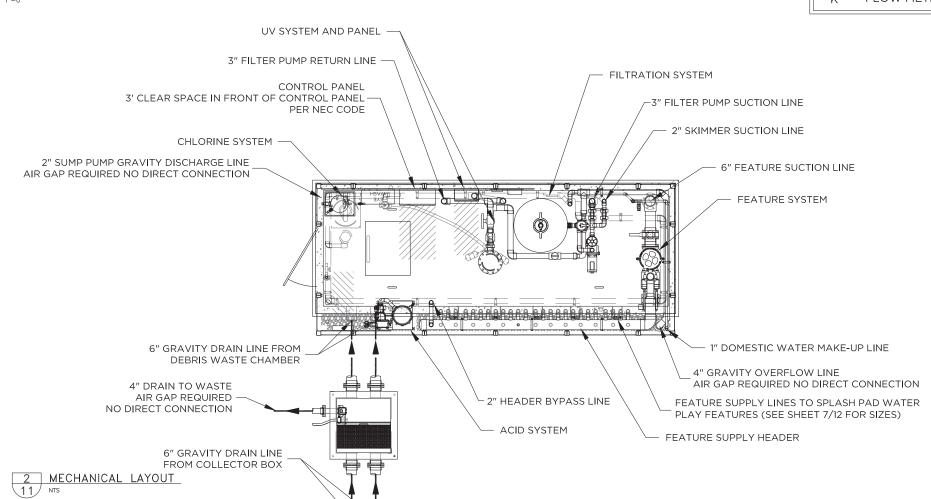
- EQUIPMENT ROOM:
 -(1) INTELIFLO PUMP VSF, 3HP, 1Ø, 230V, 16.0 amps, 135 GPM @ 60 FT/HD
- -(1) INIGH RATE STAND FILTER W/MULTI-PORT VALVE, 7.06 SQ. FT.@106GPM
 -(1) SYSTEM ELECTRICAL PANEL
 -(1) CHEMICAL CONTROLLER ORP/pH, 230V, 10amps
 -(1) CHLORINE SYSTEM (PUMP AND FEEDER)
 -(1) PH ADJUSTING SYSTEM (PUMP AND FEEDER)

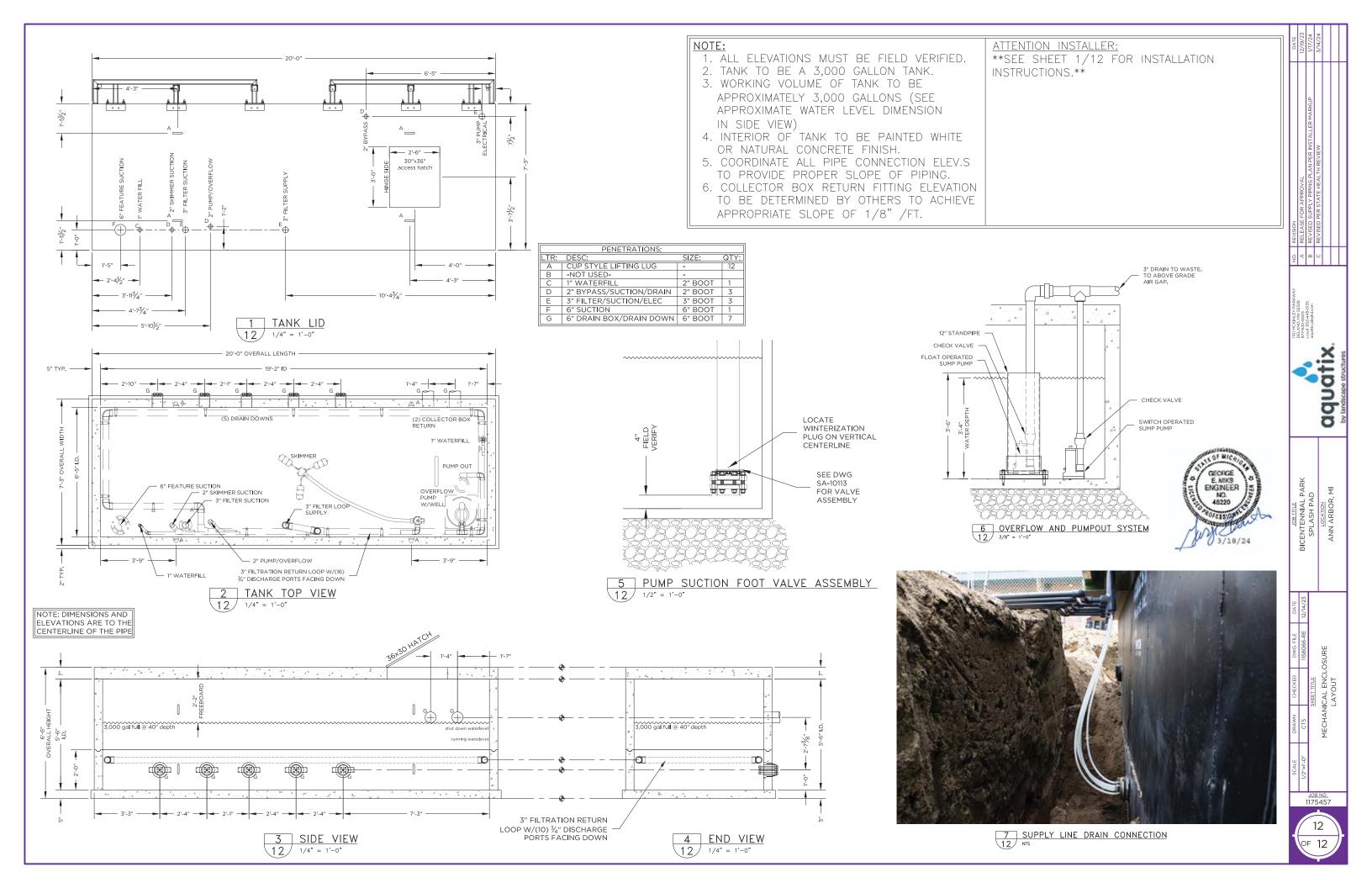
- -(1) PA 2003 HAY ARD #HYRISOL, 133 GPM, 120V/3AMP -(1) EQ SERIES EQ-750, 7.5HP, 10, 230V, 20.0 amps, 425 GPM @ 50 FT HD -(1) 6" FABRICATED SCH. 80 PVC DISTRIBUTION MANIFOLD

	1101 MCKINLEY PARKWA
	DELANO, MN 55328 877-632-0503
	Local 952-445-5135
	aquattx.playisi.com
X	

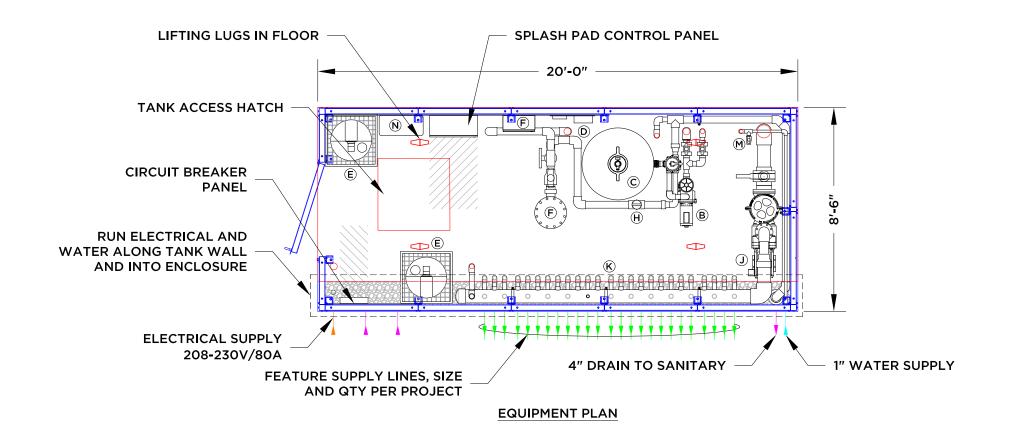
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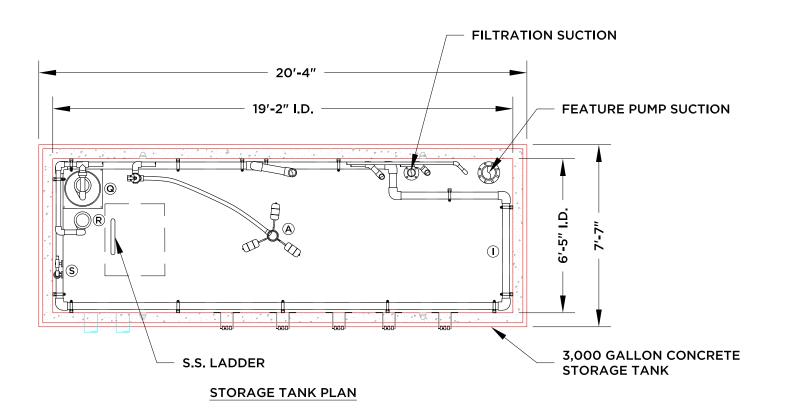
E. MIKS





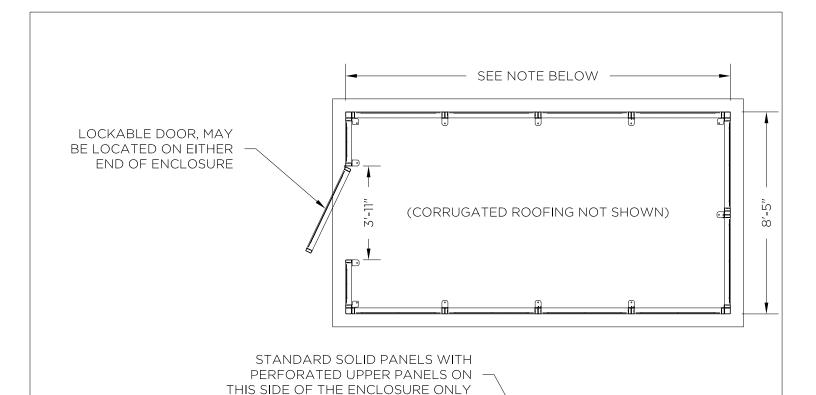
MECH20™ MECHANICAL SYSTEM INCLUDES: A-FLOATING SKIMMER **B-FILTER PUMP C-SAND FILTER D-CHEMICAL CONTROLLER** E-(2) CHEMICAL INJECTION PUMP W/30 GAL TANK F-UV LIGHT **G-ENZYME INJECTION PUMP** H-IN-LINE FLOW METER I-FILTRATION RETURN LOOP J-FEATURE PUMP K-DISTRIBUTION HEADER L-INTERIOR ROOM LIGHTS M-HOSE BIBB **N-EYEWASH STATION** O-STORAGE TANK VENT FAN P-UNDERWATER STORAGE TANK LIGHTS Q-OVERFLOW SUMP PUMP R-DRAIN SUMP PUMP S-WATERLEVEL FLOAT VALVE

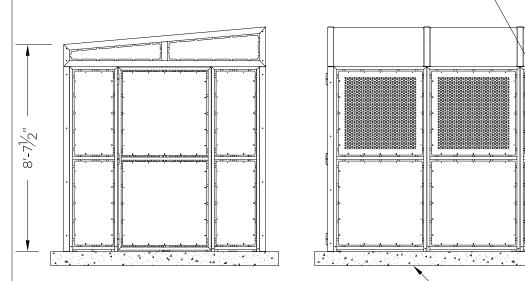


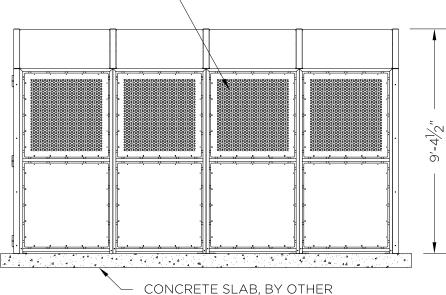












MECHANICAL ENCLOSURE NOTES:

- -STEEL STRUCTURE WITH POWDERCOAT FINISH
- -ZINC PLATED HARDWARE
- -CORRUGATED STEEL ROOF (NOT SHOWN)
- -12'-3", 16'-1\%" AND 20'-0" AVAILABLE LENGTHS
- -ACCESS DOOR CAN BE LOCATED ON EITHER END OF ENCLOSURE
- -STANDARD SOLID LOWER PANELS WITH PERFORATED UPPER PANELS ON ONE SIDE OF ENCLOSURE AS SHOWN



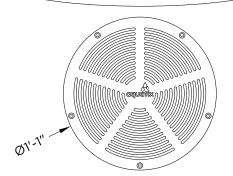
1101 McKinley Parkway Delano, MN 55328 877-632-0503 Local 952-445-5135 aquatix.playlsi.com

Mechanical Enclosure

P.J. *DRAWN BY* N.T.S. SCALE 4/6/22 *DATE* This drawing is issued in confidence for engineering information only. This drawing shall remain the property of Aquatix and may not be reproduced, disclosed to a third party, or used to manufacture anything without direct written permission from Aquatix. Unauthorized use shall entitle Aquatix to all damages caused by such user including preparation charges, lost profits, damage to reputation and attorney's fees.

Top View

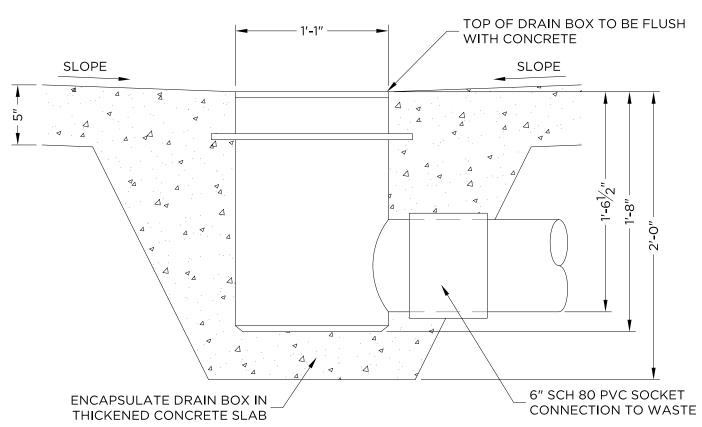
Drain Box Data:

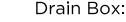


Max 120 gpm Gravity Flow Per Unit 5/16" max slot width

Note

-Above information is preliminary. Exact number of collector boxes needed for splash pad design based on total feature flow rate, size of splash pad, drainage needs for splash pad layout, and elevation/distance of collector box(s) to waste





Max. Gravity

Model No. Flow Rate: (Per Box)

DB-120-6 120 gpm

Note

-120gpm MAXIMUM drainage is based on a 1/4" per foot slope from 6" collector box drainage line to waste.

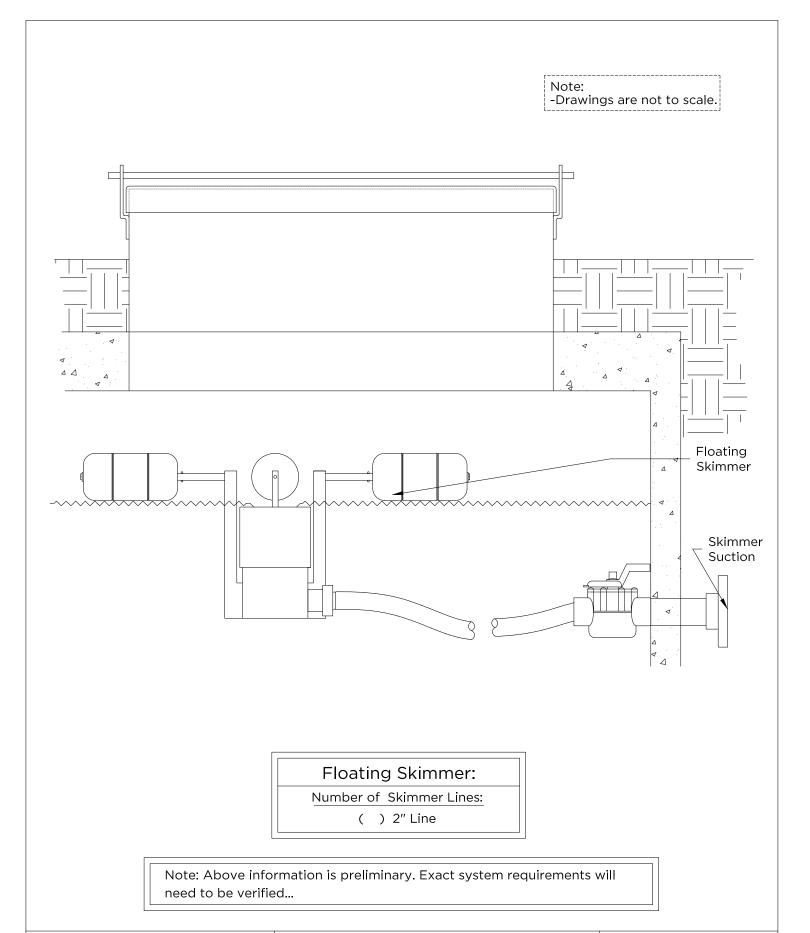


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DRAIN BOX

P.J. DRAWN BY

1 1/2"=1'-0" SCALE 2/3/21 DATE This drawing is issued in confidence for engineering information only. This drawing shall remain the property of Aquatix and may not be reproduced, disclosed to a third party, or used to manufacture anything without direct written permission from Aquatix. Unauthorlzed use shall entitle Aquatix to all damages caused by such user including preparation charges, lost profits, damage to reputation and attorney's fees.



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by landscape structures

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FLOATING SKIMMER

CJO 1 DRAWN BY

1 1/2"=1'-0" SCALE 9/22/16 DATE This drawing is issued in confidence for engineering information only. This drawing shall remain the property of Aquatix and may not be reproduced, disclosed to a third party, or used to manufacture anything without direct written permission from Aquatix. Unauthorized use shall entitle Aquatix to all damages caused by such user including preparation charges, lost profits, damage to reputation and attorney's fees.

Bloodennia Date City of Ann Ashau						
	Bicentennial Park, City of Ann Arbor					
Schedule of Pricing / Cost Estimate General Contractor: Michigan Recreational Construction September 10, 2024 – MRC PROPOSAL #: 224249A R2						
<u> </u>	ED: January 31, 2025					
ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE	
Bid Pa	ckage 1 Splash Pad and Play Equipment Installation and Site Work					
PHASI 1)	E 1A - Work included in Contract Install Splash Pad	1	LSUM	\$256,800.00	\$256,800.00	
2)	Install Playground Equipment	1	LSUM	\$56,700.00	\$56,700.00	
3)	Shower Tower and Catch Basin	1	LSUM	\$2,077.00	\$2,077.00	
50)	Shower Tower	1	LSUM	\$8,523.00	\$8,523.00	
4)	Restroom Improvements Misc Structures Rem	1	LSUM	\$254,250.00 \$3,900.00	\$254,250.00 \$3,900.00	
5) 6)	Misc Structures, Rem Storm Sewer, Rem, Less than 24 inch	1 175	LSUM Ft	\$3,900.00 \$65.00	\$3,900.00 \$11,375.00	
7)	Pavt, Rem	2,600	Syd	\$17.55	\$45,630.00	
8)	Curb and Gutter, Rem	20	Ft	\$39.00	\$780.00	
9)	Storm Sewer, Cl A, 4 inch, Tr Det A Storm Sewer, RCP Cl III, 12 inch, Tr Det A	35 49	Ft Ft	\$113.00 \$148.00	\$3,955.00 \$7,252.00	
11)	Storm Sewer, RCP CI III, 18 inch, Tr Det A	133	Ft	\$164.00	\$21,812.00	
12)	Storm Sewer, RCP CI III, 18 inch, Tr Det B	6	Ft	\$164.00	\$984.00	
13)	Culv End Sect, 12 inch Culv End Sect, 18 inch	2	Ea Ea	\$4,150.00 \$5,200.00	\$8,300.00 \$5,200.00	
15)	Dr Structure, Rem	1	Ea	\$1,300.00	\$1,300.00	
16)	Dr Structure, 48 inch dia	3	Ea	\$4,300.00	\$12,900.00	
17)	Outlet Control Structure	1	Ea	\$23,250.00	\$23,250.00	
18)	Storm Sewer, Tap, 12 inch Storm Sewer, Tap, 15 inch	1	Ea Ea	\$1,800.00 \$2,200.00	\$1,800.00 \$2,200.00	
20)	Dr Structure Cover, Adj, Case 2	1	Ea	\$1,100.00	\$1,100.00	
21)		1	LSUM	\$170,100.00	\$170,100.00	
22)	Erosion Control, Silt Fence Erosion Control, Inlet Protection, Fabric Drop	2,200	Ft Ea	\$4.90 \$200.00	\$10,780.00 \$1,200.00	
24)	Construction Staking	1	LSUM	\$23,150.00	\$23,150.00	
31)	Splash Pad Concrete and Apron	2850	Sft	\$17.40	\$49,590.00	
35)	Non Haz Contaminated Material Handling and Disposal	2	CYD	\$500.00	\$1,000.00	
36)	Water Service, Type K Copper, 1 inch, Tr Det F	175	Ft	\$65.20	\$11,410.00	
37)	Water Service, Type K Copper, 1 inch, Tr Det G	75	Ft _	\$65.20	\$4,890.00	
38)	Curb Stop and Box, 1 inch Electrical Conduit, 2 inch	1,500	Ea Ft	\$6,900.00 \$13.00	\$6,900.00 \$19,500.00	
40)	Testing	1	LSUM	\$3,975.00	\$3,975.00	
_	Splash Pad Signage	3	Ea	\$150.00	\$450.00	
42) 49)	Backflow Preventer, Enclosure and Concrete Pad Pre-treatment Basin Liner	1	LSUM	\$7,300.00 \$110,500.00	\$7,300.00 \$110,500.00	
_	Monitoring Well, Adj	2	Ea	\$900.00	\$1,800.00	
25)	Testing	1	LSUM	\$3,000.00	\$3,000.00	
26)	SESC Permit Building Permit	1	LSUM	\$3,000.00 \$9,500.00	\$3,000.00 \$9,500.00	
46)	Bonds & Insurance (2%)	1	LSUM	\$22,479.00	\$22,479.00	
47)	Mobilization (5%)	1	LSUM	\$79,710.00	\$79,710.00	
PHASI	E 1A SUBTOTAL				\$1,270,322.00	
i iirioi	LINGUIGIAL				V1,270,022.00	
PHAS	E 1B - Not to commence until Formal Authorization from Contract Administrator					
43)	Chain Link Fence, Vinyl Coated, 4'	300	Ft	\$57.00	\$17,100.00	
44)	Chain Link Fence, Vinyl Coated, 4'	330	Ft	\$57.00	\$18,810.00	
48)	Install Shade Sails	1	LSUM	\$50,500.00	\$50,500.00	
51)		20	Ft	\$88.40	\$1,768.00	
52)	Sidewalk, Conc, 4 inch	19,045	Sft	\$10.40	\$198,068.00	
53)	Seeding, Lowland	600	SYD	\$6.00	\$3,600.00	
54)	Turf Establishment	1	LSUM	\$132,100.00	\$132,100.00	
55)	Testing	1	LSUM	\$3,975.00	\$3,975.00	
PHAS	E 1B SUBTOTAL				\$425,921.00	
	E 1C - WORK TO BE PERFORMED BY OTHERS Prepare Subbase for Safety Surface - Vendor Installation - Already Procured	7,000	Sft	N/A	N/A	
	Install Site Furnishings—Park Operations	1	LSUM	N/A	N/A	
	Pavillion Improvements (Includes removal of old roof system, and installation of new T&G roof decking and					
star	iding seam roof) - Park Operations	1	LSUM	N/A	N/A	
61) 30)	Clearing - Park Operations Quercus Macrocarpa, 5 inch caliper – Elizabeth Dean Fund	1	LSUM Ea	N/A N/A	N/A N/A	
31)	Acer Rubrum, 2.5 inch caliper – Elizabeth Dean Fund	6	Ea	N/A N/A	N/A N/A	
32)	Betula Nigra, 2.5 inc caliper – Elizabeth Dean Fund	7	Ea	N/A	N/A	
	EGLE Permit - Park Planning	1	LSUM	N/A	N/A	
36)	Storm Water Discharge Permit - Park Planning	1	LSUM	N/A	N/A	
GRAN	DTOTAL				\$1,696,243.00	

CITY OF ANN ARBOR PREVAILING WAGE DECLARATION OF COMPLIANCE

The "wage and employment requirements" of Section 1:320 of Chapter 14 of Title I of the Ann Arbor City Code mandates that the city not enter any contract, understanding or other arrangement for a public improvement for or on behalf of the city unless the contract provides that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. Where the contract and the Ann Arbor City Code are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used. Further, to the extent that any employees of the contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with section 1:320 of Chapter 14 of Title I of the Code of the City of Ann Arbor, employees shall be paid a prescribed minimum level of compensation (i.e. Living Wage) for the time those employees perform work on the contract in conformance with section 1:815 of Chapter 23 of Title I of the Code of the City of Ann Arbor.

At the request of the city, any contractor or subcontractor shall provide satisfactory proof of compliance with this provision.

The Contractor agrees:

Phone/Email address

- (a) To pay each of its employees whose wage level is required to comply with federal, state or local prevailing wage law, for work covered or funded by this contract with the City,
- (b) To require each subcontractor performing work covered or funded by this contract with the City to pay each of its employees the applicable prescribed wage level under the conditions stated in subsection (a) or (b) above.
- (c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the wage and employment provisions of the Chapter 14 of the Ann Arbor City Code. The undersigned certifies that he/she has read and is familiar with the terms of Section 1:320 of Chapter 14 of the Ann Arbor City Code and by executing this Declaration of Compliance obligates his/her employer and any subcontractor employed by it to perform work on the contract to the wage and employment requirements stated herein. The undersigned further acknowledges and agrees that if it is found to be in violation of the wage and employment requirements of Section 1:320 of the Chapter 14 of the Ann Arbor City Code it shall has be deemed a material breach of the terms of the contract and grounds for termination of same by the City.

Michigan Recreational Construction, Inc.

Company Name
Od/11/2024
Signature of Authorized Representative
Date
Craig A Sheffer, President
Print Name and Title
1091 Victory Drive, Howell MI 48843
Address, City, State, Zip
313-806-8406 / craig@buildingfun.com

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500

9/25/15 Rev 0 PW

CITY OF ANN ARBOR LIVING WAGE ORDINANCE

RATE EFFECTIVE APRIL 30, 2024 - ENDING APRIL 29, 2025

\$16.43 per hour

If the employer provides health care benefits*

\$18.32 per hour

If the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than \$10,000 in a twelve-month period of time must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than \$500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

* Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed \$.50 an hour for an average work week; and the employer cost or contribution must equal no less than \$1/hr for the average work week.

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

For Additional Information or to File a Complaint contact Colin Spencer at 734/794-6500 or cspencer@a2gov.org

Revised 2/1/2024

CITY OF ANN ARBOR LIVING WAGE ORDINANCE DECLARATION OF COMPLIANCE

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that an employer who is (a) a contractor providing services to or for the City for a value greater than \$10,000 for any twelvementh contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than \$10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than \$10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here [___] No. of employees__

	Τ	he (Cont	tracto	r or	Gran	tee	agr	ees:
--	---	------	------	--------	------	------	-----	-----	------

(a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as \$16.43/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than \$18.32/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

Check the applicable box below which applies to your workforce				
	Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits			
\checkmark	Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits			

- (b) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.
- (c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.
- (d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.
- (e) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

Michigan Recreational Constr	uction, Inc	1091 Victory Drive		
Company Name		Street Address		
ChASL	2/20/2025	Howell, MI 48843		
Signature of Authorized Representative	Date	City, State, Zip		
Craig A. Sheffer, President		517-545-7122/ craig@buildingfun.com		
Print Name and Title		Phone/Email address		



Vendor Conflict of Interest Disclosure Form

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict of interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

- 1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
- 2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
- 3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
- 4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
- 5. Please note any exceptions below:

Conflict of Interest Disclosure*			
Name of City of Ann Arbor employees, elected	() Relationship to employee		
officials or immediate family members with whom there may be a potential conflict of interest.	() Interest in vendor's company () Other (please describe in box below)		
*Disclosing a potential conflict of interest does not disquali	fy vendors. In the event vendors do not disclose potential		

conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:					
, Vendor Name			Vendor Phone Number		
CYASL					
Signature of Vendor Authorized Representative	Da	ate	Printed Name of Vendor Authorized Representative		

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500, procurement@a2gov.org

CITY OF ANN ARBOR DECLARATION OF COMPLIANCE

Non-Discrimination Ordinance

The "non discrimination by city contractors" provision of the City of Ann Arbor Non-Discrimination Ordinance (Ann Arbor City Code Chapter 112, Section 9:158) requires all contractors proposing to do business with the City to treat employees in a manner which provides equal employment opportunity and does not discriminate against any of their employees, any City employee working with them, or any applicant for employment on the basis of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight. It also requires that the contractors include a similar provision in all subcontracts that they execute for City work or programs.

In addition the City Non-Discrimination Ordinance requires that all contractors proposing to do business with the City of Ann Arbor must satisfy the contract compliance administrative policy adopted by the City Administrator. A copy of that policy may be obtained from the Purchasing Manager

The Contractor agrees:

- (a) To comply with the terms of the City of Ann Arbor's Non-Discrimination Ordinance and contract compliance administrative policy, including but not limited to an acceptable affirmative action program if applicable.
- (b) To post the City of Ann Arbor's Non-Discrimination Ordinance Notice in every work place or other location in which employees or other persons are contracted to provide services under a contract with the City.
- (c) To provide documentation within the specified time frame in connection with any workforce verification, compliance review or complaint investigation.
- (d) To permit access to employees and work sites to City representatives for the purposes of monitoring compliance, or investigating complaints of non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the Ann Arbor Non-Discrimination Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Non-Discrimination Ordinance, obligates the Contractor to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract.

Company Name	
Signature of Authorized Representative	Date
Print Name and Title	
Address, City, State, Zip	
Phone/Email Address	

Questions about the Notice or the City Administrative Policy, Please contact:

Procurement Office of the City of Ann Arbor

(734) 794-6500

2016 Rev 0 NDO-2