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23-012-TRC

Site Plan Review Staff Report



Applicant | Westlake Royal Roofing, LLC



Prepared for The City of Okeechobee



General Information

Owner: Westlake Royal Roofing Applicant: Westlake Royal Roofing, LLC Primary Contact: Andy Medina, amedina@sloaneg.com, (863) 800-3046 Site Address: 858 NE 12th Street Parcel Identification: 3-15-37-35-0020-00000-0010, 3-15-37-35-0020-00000-0020, and 3-15-37-35-0020-00000-0030

Note: For the legal description of the project or other information relating this application, please refer to the application submittal package which is available by request at City Hall and is posted on the City's website prior to the advertised public meeting at: <u>https://www.cityofokeechobee.com/agendas.html</u>

Future Land Use, Zoning, and Existing Use of Subject Property(s)

	Existing	Proposed		
Future Land Use	Industrial	Industrial		
Zoning	Industrial	Industrial		
Use of Property	Outdoor Storage, vacant	Wholesale Sales and Distribution, Outdoor Storage		
Acreage	8.31	8.31		

Future Land Use, Zoning, and Existing Use of Surrounding Properties

	Future Land Use	Zoning	Existing Use
North	Industrial	Industrial (IND)	Manufacturing & Outdoor Storage
East	Industrial	Industrial (IND)	Vacant
South	Industrial	Industrial (IND)	Vacant
West	Industrial	Industrial (IND)	Vacant

General Description

The request is for approval of a site plan to be completed in two-phases. Phase 1 includes construction of paved outdoor storage areas, internal vehicle circulation roads, and drainage/stormwater management facilities. Phase 2 involves the construction of a 3,000 square feet shipping and receiving building with associated parking and additional paved outdoor storage and stormwater management facilities. The site was previously 3 separate lots, though the applicant has filed a joinder for all three lots to be combined into one parcel and has provided approval by Okeechobee County of recording of the joinder. A site plan was previously approved for Lot 3 under application 23-002-TRC, which included plans for outdoor storage, stormwater



management facilities and perimeter landscaping. The applicant has stated that the property subject to this request will be utilized as part of the operations for the parcel to the north, which contains an existing manufacturing facility. Plans for expansion of that facility have been submitted under companion application 23-011-TRC. Areas of deficiency or concern are highlighted in yellow.

Adequacy of Public Facilities

<u>Potable Water and Sewer</u>: Applicant has listed OUA as a provider but has not provided letters of availability.

Traffic Generation: No traffic impact statement provided.

Access and Internal Circulation: Vehicle circulation plans should be provided to explain how this site will be utilized in conjunction with the adjacent manufacturing facility.

Service Vehicle Access and Egress:

Fire Truck: Sufficiency of fire truck access and egress to be addressed by the Fire Department.

Loading Zone : Loading areas not identified and building size does not require loading area.

Solid Waste Collection: Dumpster location and dimensions not identified.

Compatibility with Adjacent Uses

The applicant is proposing to expand an existing outdoor storage use located within the City's industrial park and add a shipping and receiving building with parking. As part of the operations, a significant portion of the site is devoted to outdoor storage. These uses are consistent with the comprehensive plan and the city's code; and are compatible with the other industrial uses in the industrial park. Staff is aware of vehicle queuing that occurs on public rights of way generated by the existing manufacturing facility. Applicant should demonstrate how this site will be utilized in conjunction with the adjacent manufacturing facility, especially in the context of proposed expansion. The primary concern is that the expansion could increase vehicle queuing in the rights-of-way which negatively impacts other users of the industrial park.

Regulation	Requirement	Provided
Permitted Uses §90-342	Manufacturing and Outdoor Storage are permitted principal uses within the IND district	In compliance
Minimum Lot Area §90-345(1)	As needed to comply with requirements set out in this division	8.31 acres
Minimum Lot Width §90-345(1)	None	

Compliance with Land Development Code



Regulation	Requirement	Provided
Min front yard setback §90-345(2)	25'	25' front setback provided
Yards on corner lots §90-447	Any yard adjoining a street shall be considered a front yard. That yard upon which the property is addressed is required to comply with the minimum depth requirements of the regulations of this article. All other front yards shall be not less than 75 percent of the required minimum depth. $25 \times 0.75 = 18.75'$	25' street setbacks provided
Minimum Required Side Setback §90-345(2)	15'; 40' abutting residential zoning district	N/A
Minimum Required Rear setback §90-345(2)	20'; 40' abutting a residential zoning district.	20' setback provided
Max lot coverage §90-345(3)	50%	1%
Max impervious surface §90-345(3)	85%	59%
Max height §90-345(4)	45 feet, for any structure in which workers are employed and occupy, or a structure not occupied but which is in the nature of a silo, spire, storage elevator, towers and similar structures Additional height may be approved	No elevation plans provided
Parking spaces location §90-511(a)	by special exception Required off-street parking and loading spaces shall be located on the same parcel as the primary use, unless approved by TRC upon submittal of written agreement to ensure continued availability	In compliance
Min parking space dimensions §90-511(b)	9' by 20'	9' by 20'
Min loading space dimensions §90-511(c)	10' by 30', with 14' of vertical clearance	No loading space is required or provided





Regulation	Requirement	Provided
Min parking access	a. AParking spaces between 75° and	Aisle is 24'
width	90° to the driveway: 24'	
§90-511(d)(2)	b. AParking spaces angled from 60°	
	up to but not including 75° to the	
	driveway: 20'	
	c.ÁParking spaces any other angle to	
	the driveway: 16'	
Paving	Each parking and loading space shall	Paving type not indicated
§90-511(e)(1)	be paved	
Parking and loading	Each parking space shall be designed	In compliance
space layout	to permit access without moving	
§90-511(e)(2)	another vehicle.	
Parking and loading	Buildings, parking and loading areas,	In compliance
space layout	landscaping and open spaces shall be	
§90-511(e)(3)	designed so that pedestrians moving	
	between parking areas and buildings	
	are not unreasonably exposed to	
	vehicular traffic hazards.	
Parking and loading	Paved pedestrian walks shall be	In compliance
space layout	provided along the lines of the most	·
\$90-511(e)(4)	intense use, particularly between	
	building entrances to streets, parking	
	areas, and adjacent buildings.	
Parking and loading	For new construction, no parking	In compliance
space layout	space accessed via a driveway from a	in compliance
§90-511(e)(6)	public road shall be located closer	
300-011(0)(0)	than 20 feet from the right-of-way	
	line of said public road.	
Number of off-street	1 per 1,000 sf of floor area up to	30 parking spaces
parking spaces for	20,000 square feet plus 1 per 2,000	So parking spaces
Industrial	square feet of floor area to 40,000	
§90-512(5)	•	
890-212(2)	square feet, plus 1 per 4,000 square	
	feet of floor area over 40,000 square	
	feet	
	2 monthing an angle of the 2 000 of	
	<u>3 parking spaces req for 3,000 sf</u>	
	building	
Min number of ADA	2 ADA spaces required for 26 to 50	2 ADA spaces proposed
parking spaces	spaces provided	
FL Accessibility Code		
§208.2		
Min ADA parking space	12' by 20' w/ a 5' wide access aisle	12' by 20' with 5' access aisle
dimensions		
FL Accessibility Code		
§502		



Regulation	Requirement	Provided
Min number of off-	1 for 5,000 to 25,000 sf, plus	no loading spaces required or
street loading spaces	1 for 25,000 to 60,000 sf, plus	provided
§90-513(2)	1 for 60,000 to 120,000 sf, plus	
300 0-0(-)	1 for 120,000 to 200,000 sf, plus	
	1 for each additional 90,000 sf	
	0 spaces are required for a 3000sqft	
	building	
Required Landscaping	At least 1 tree and 3 shrubs shall be	No landscape plan provided
§90-532	planted for every 3,000 sq/ft of lot	
-	area, excluding areas of existing	
	vegetation which are preserved.	
	<u>362,036 ÷ 3,000 = 121 trees req and</u>	
	362 shrubs req	
All vehicular use areas cor	ntaining eight or more parking spaces, or	r containing an area greater than
	ovide perimeter and interior landscapin	
Landscaping	At least 18 square feet of landscaped	No landscape plan provided
Requirements for	area for each required parking space.	
Parking and Vehicular		
Use Areas	<u>3 x 18 = 54</u>	
§90-533(1)		
Landscaping	At least one tree for each 72 square	No landscape plan provided
Requirements for	feet of required landscaped area.	
Parking and Vehicular		
Use Areas	<u>54 ÷ 72 = 1</u>	
§90-533(2)		
Landscaping	Shade trees shall be planted at no	No landscape plan provided
Requirements for	more than 20 feet on centers	
Parking and Vehicular		
Use Areas		
§90-533(3)		
Landscaping	A minimum two feet of landscaping	No landscape plan provided
Requirements for	shall be required between vehicular	
Parking and Vehicular	use areas and on-site buildings and	
Use Areas	structures, except at points of ingress	
§90-533(4)	and egress.	
Landscaping	The minimum dimension for any	In compliance
Requirements for	required landscaped area within a	
Parking and Vehicular	parking or vehicular use area shall be	
Use Areas	four feet except for that adjacent to	
§90-533(5)	on-site buildings and structures.	



Regulation	Requirement	Provided
Landscaping Requirements for Parking and Vehicular Use Areas §90-533(6)	A landscaped island, minimum five feet by 15 feet and containing at least one tree, shall be required for every ten parking spaces with a maximum of 12 uninterrupted parking spaces in a row.	In compliance
Landscaping Requirements for Parking and Vehicular Use Areas §90-533(7)	The remainder of a parking landscape area shall be landscaped with grass, ground cover, or other landscape material.	No landscape plan provided
Landscape buffer areas §90-534(1)	Minimum width of buffer along street frontage shall be ten feet and on other property lines, two feet.	In compliance
Landscape buffer areas §90-534(2)	At least 1 tree and 3 shrubs for each 300 sq/ft of required landscaped buffer <u>~631 linear ft of non-driveway</u> frontage on 12 th St requires 6,310 sf of landscaped area with 21 trees and 63 shrubs <u>~1,093 linear ft of non-driveway</u> frontage on 9 th Ave requires 10,930 sf of landscaped area with 37 trees and 110 shrubs <u>~721 linear ft of property line on the</u> West side of property requires 1,442 sf of landscaped area with 5 trees and 15 shrubs	No landscape plan provided. No landscape plan provided. No landscape plan provided.
Landscape buffer areas §90-534(3)	Trees may be planted in clusters, but shall not exceed 50' on centers abutting the street	No landscape plan provided
Landscape buffer areas §90-534(4)	The remainder of a landscape buffer shall be landscaped with grass, ground cover, or other landscape material.	No landscape plan provided
Landscape design and plan §90-538(a)	Proposed development, vehicular and pedestrian circulation systems, and site drainage shall be integrated into the landscaping plan.	No landscape plan provided
Landscape design and plan §90-538(b)	Existing native vegetation shall be preserved where feasible, and may be used in calculations to meet these landscaping requirements.	No landscape plan provided



Regulation	Requirement	Provided
Species diversification §90-538(c)	When more than ten trees are required to be planted, two or more species shall be used.	No landscape plan provided
Tree spacing from utility structures §90-538(d)	Trees and shrubs shall not be planted in a location where at their maturity they would interfere with utility services	No landscape plan provided
Landscape design and plan §90-538(e)	Trees should maximize the shading of pedestrian walks and parking spaces.	No landscape plan provided
Landscape design and plan §90-538(f)	Landscaping ground covers should be used to aid soil stabilization and prevent erosion.	No landscape plan provided
Landscape design and plan §90-538(g)	Landscaping shall be protected from vehicular encroachment by means of curbs, wheel stops, walks or similar barriers.	No landscape plan provided
Alternative landscape design and plan §90-539(a)	An applicant shall be entitled to demonstrate that the landscape and buffer requirements can be more effectively met by an alternative landscape plan.	No landscape plan provided
Alternative landscape design and plan §90-539(b)	Upon review and recommendation, the technical review committee may approve an alternative landscape plan.	The TRC has the authority to approve an alternative landscape plan in lieu of providing a landscape plan that meets strict code requirements.
Drought tolerance §90-540(b)	At least 75 percent of the total number of plants required shall be state native very drought tolerant species as listed in the South Florida Water Management District Xeriscape Plant Guide. However, when a landscape irrigation system is installed, at least 75 percent or the total number of plants required shall be state native moderate or very drought tolerant species.	No landscape plan provided
Min tree size §90-540(c)	Trees shall be at least ten feet high and two inches in diameter measured four feet above ground level at the time of planting.	No landscape plan provided



Regulation	Requirement	Provided
Utility Corridor	No tree shall be planted where it	No landscape plan provided
Requirements	could, at mature height, conflict with	
§90-543(b)	overhead utility lines. Larger trees	
	(trees with a mature height of 30 feet	
	or more) shall be planted no closer	
	than a horizontal distance of 30 feet	
	from the nearest overhead utility	
	line. Medium trees (trees with a	
	height of 20 to 30 feet) shall be offset at least 20 feet horizontally from the	
	nearest overhead utility line. Small	
	trees (trees with a mature height of	
	less than 20 feet) shall not be	
	required to meet a minimum offset,	
	except that no tree, regardless of size	
	shall be planted within five feet of	
	any existing or proposed utility	
	implement.	
Exclusions from height	In any nonresidential district, the	No elevation plans provided
limits	height limitations do not apply to	
§90-453	spires, belfries, cupolas, water tanks,	
	ventilators, chimneys or other	
	appurtenances; provided, however,	
	that they shall not exceed Federal	
	Aviation Administration height limitations.	
Outdoor Storage	Goods and materials shall not be	Areas identified for outdoor
§90-454	stored in required yards (setbacks)	storage meet all required
300 101		setbacks
Lighting	All off-street parking areas, service	Lighting plan does not
§78-71 (a)(5)	roads, walkways and other common	demonstrate that the proposed
	use exterior areas open to the public	lighting will be directed away
	shall have a minimum of one-half	from public streets and
	horizontal foot-candle power of	<mark>residential areas or a hazard or</mark>
	artificial lighting. Lighting, when	distraction to motorists. Foot-
	provided, shall be directed away from	candle values are relatively high
	public streets and residential areas	adjacent to property lines and
	and shall not be a hazard or	are not provided outside of
	distraction to motorists traveling a	property lines.
	street.	



Recommendation

Based on the foregoing analysis, we recommend revisions to the application package to include the following:

- 1.Á Provide letters of availability from OUA demonstrating adequate capacity of water and sewer services.
- 2.ÁProvide a traffic impact statement, including how this site will be utilized for the manufacturing operations associated with the abutting site to the north, and demonstrating proposed vehicle circulation patterns and stacking capacity for vehicles waiting to drop off or pick up materials/products.
- 3. Á Provide dumpster location and dimensions on plans.
- 4. Á Provide elevation plans for proposed structure.
- 5.ÁIndicate paving types to be utilized throughout plans.
- 6.ÁProvide a landscape plan. Plan should either comply with all LDC requirements or applicant shall request approval by TRC of alternate landscape plan and indicate why the alternative landscape plan is appropriate for this site.
- 7.Á Proposed lighting plan indicates relatively high light intensities at property lines. Please demonstrate that lighting intensities are appropriate for this location and will not disrupt surrounding areas. Please indicate light pole heights and provide light fixture specifications. Clearly depict property boundaries on lighting plan. Demonstrate that light poles are located on subject property and not in the public rights-of-way.
- 8.ÁA special exception approval is required for structures exceeding 45 feet in height.

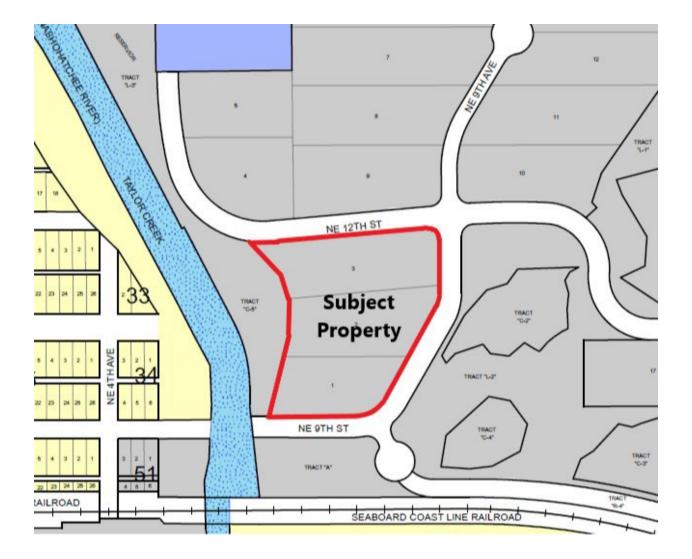
Submitted by:

Ben Smith, AICP Director of Planning December 8, 2023

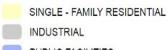
Okeechobee Technical Review Committee Hearing: December 21, 2023



Future Land Use Map

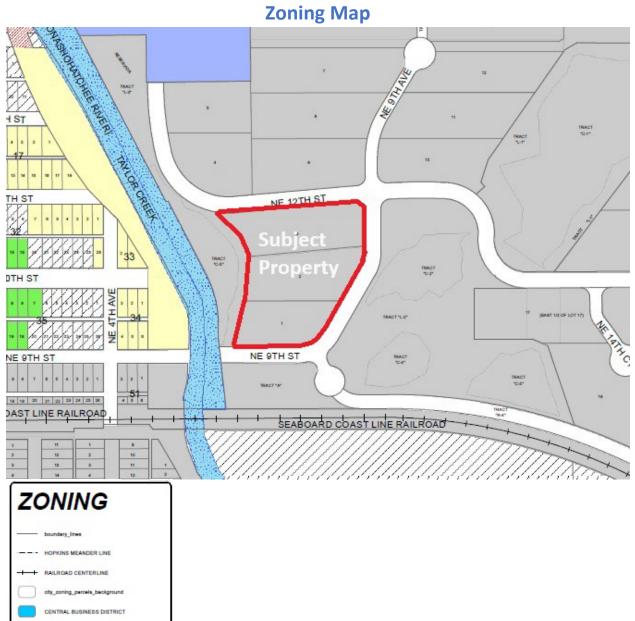


LAND USE CLASSIFICATIONS



PUBLIC FACILITIES









Aerial Identifying Existing Land Use





CITY OF OKEECHOBEE

Application for Site Plan Review

Pag 1 of 3

	_		11								
		TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT	City of Okcechobee General Services Department 55 S.E. 3 rd Avenue, Room 101			Date Received 10-31-33					
					Application No. 23-012-TRC					\mathcal{C}	
					Fee Paid: 11-6-23 \$1249.30					30	
			Okeechobee, Florida 34974			Receipt No. R 0000 5200					<u>)</u>
			Phone: (863) 763-3372, (Fax: (863)763-1686 E-mail <u>: pburnette@cityo</u>		Hearing I	Date:		12-2	1-23	5	
			APPLICANT INFORMATION								
	I	Name of property owner(s): Wes	tlake Royal Roofing I	LLC.							
	2	Owner mailing address: 2801 Pc	ost Oak Blvd, Suite 6	00 Ho	uston TX	77056					
	3	Name of applicant(s) if other that	an owner:								
	4	Applicant mailing address:									
[5	Name of contact person (state rela	ationship): Andy Medin	a, Pro	ject Man	ager					
	6	Contact person daytime phone(s)	and email address: 863-8	300-30)46/ame	dina@slo	bane	g.cc	m		
	7	Engineer: Name, address and pho	ne number: Santos Me	edina	II P.O. E	Box 253	Bart	ow I	FL 3383	31 863-8	00-3046
	Surveyor: Name, address and phone number: Robert Lazenby IV P.O. Box 253 Bartow FL							FL 338	31 863-8	00-3046	
		PROPERTY and PROJECT INFORMATION									
		Property address/directions to property: NE-9th Avenue Okeechobee									
	9	858 NEI2th St									
*	10	Parcel Identification Number 3-1	5-37-35-0020-0000)-001	0/0020/0	030	31	53	13500	20000	000030
	11										
	12	Current Zoning district: AE	INDUSTRIAL.								
	13	Describe the project including all proposed uses, type of construction and conceptual building layout, how the business or use is expected to operate on the site, including but not limited to: number of employees expected; hours of operation; location, extent and type of any outdoor storage or sales, etc., and fire flow layout. Use additional page if necessary.									
	15	The project is an expansion to the existing facility. The next phase will include additional paved outdoor storage are with required storm water improvements. A future phase will include a Shipping/Receiving building with associated parking.									
		Describe existing improvements on property (for example, the number and type of buildings, dwelling units, occupied or vacant, etc.). Use additional page if necessary.				d or					
	14	Lot 3 is currently an unpaved outdoor storage area. Lots 1 & 2 are currently vacant.									
	15	Total land area in square feet (if le	ess than two acres):		or a	cres: 8,31		_			
ł	16	Isproposed use different from ex			Yes)	[k	No	5)		
L	10	1 -1			,						

* Winder of 3 Parcels was recorded on 11-14-23

Rev. 08/23

CITY OF OKEECHOBEE

Application for Site Plan Review

17	Number and description of phases: There will two phases.
18	Source of potable water: OUA
19	Method of sewage disposal: OUA

		ATTACHMENTS REQUIRED FOR ALL APPLICATIONS					
	20	Applicant's statement of interest in property OWNER					
1 miles	21	One (1) copy of last recorded warranty deed					
\checkmark	22	Notarized letter of consent from property owner (if applicant is different from property owner)					
\checkmark	23	 Three (3) CERTIFIED BOUNDARY and TOPOGRAPHIC surveys, (one to be no larger than 11 x 17; scale not less than one inch to 20 feet; North point) containing: a. Date of survey, surveyor's name, address and phone number b. Legal description of property pertaining to the application c. Computation of total acreage to nearest tenth of an acre 					
		d. Location sketch of subject property, and surrounding area within one-half mile radius					
	24	Two (2) sets of aerials of the site.					
\checkmark	25	Two (2) copies of sealed site plan drawings (see attached checklist for details of items to be included)					
	26	Two (2) copies of drawing indicating facades for all buildings, including architectural elevations.					
	27	Two (2) copies of landscape plan, including a separate table indicating the number of trees and shrubs by type and showing both the official and common name of each type of tree and shrub.					
\checkmark	28	Two (2) copies of photometric lighting plan (see Code of Ordinances & LDR's Section 78-71 (A) (5)).					
V	29	Two (2) copies of sealed drainage calculations.					
	30	Attach a Traffic Impact Study prepared by a professional transportation planner or transportation engineer, if the rezoning or proposed use will generate 100 or more peak hour vehicle trip ends using the trip generation factors for the most similar use as contained in the Institute of Transportation Engineers most recent edition of <u>Trip Generation</u> . The TIA must identify the number of net new external trips, pass-bay calculations, internal capture calculations, a.m. and p.m. peak hour trips and level of service on all adjacent roadway links with and without the project.					
	31	USB flash drive of application					
	32	Nonrefundable application fee: \$1,000.00 plus \$30.00 per acre. NOTE: Resolution No. 98-11 Schedule of Land Development Regulation Fees and Charges - When the cost for advertising, publishing and mailing notices of public hearings exceeds the established fee, or when a professional consultant is hired to advise the City on the application, the applicant shall pay the actual costs.					
	NOT						
		TE: Submissions will be reviewed by the General Services Coordinator and City Planner for all necessary mentation. The Applicant will be notified at least 10 days prior to the TRC meeting whether or not					
		itional information is required to proceed or if the review will be rescheduled to the next TRC meeting.					
		Confirmation of Information Accuracy					
		I hereby certify that the information in this application is correct. The information included in this application is for use by the City of Okeechobee in processing my request. False or misleading information may be punishable by a fine of up to 500.00 and imprisonment of up to 30 days and may result in the summary denial of this application.					
		Chio Kedu Chris Hedrick 10/26/2023					
l		Signature Printed Name Date					
10							

For questions relating to this application packet, call the General Services Dept. at (863) 763-3372, Ext. 9820 Rev. 08/23

CITY OF OKEECHOBEE

Application for Site Plan Review

City of Okeechobee Checklist for Site Plan Review

		REQUIRED INFORMATION
1		Completed application (1)
2		Map showing location of site (may be on the cover sheet of site plan)
3		Two (2) copies of sealed site plan drawings prepared at a scale no smaller than one inch equals 60 feet, or in the case of small projects, the largest scale that can accommodate the entire site and all areas within 50 feet of the project boundary, and the scale, legend, and author block all on one 24" by 36" sheet. The site plan drawings shall include the location of all existing and proposed improvements, including, but not limited to:
	3.1	Water courses, water bodies, floodplains, wetlands, important natural features and wildlife areas, soil types, protected trees and vegetation or environmentally sensitive areas
	3.2	Streets, sidewalks, property lines and rights-of-way
	3.3	Utility lines/facilities, fire hydrants, septic tanks and drainfields
	3.4	Bridges, culverts and stormwater management facilities
	3.5	Buildings and structures and their distances from boundaries of the property, streets, and other structures
	3.6	Setback lines and required yards
	3.7	Ingress and egress to the site and buildings
	3.8	Vehicular use areas including off-street parking and loading areas
	3.9	On-site recreation and open space
	3.10	Landscaping, screens, buffers, walls, and fences,
	3.11	Method of solid waste collection and locations of and access to dumpsters
	3.12	Lighting and signs
4		Drawing notes and tabulations showing the following information shall be included along with the plan:
	4.1	Name, address and phone number of the owner
	4.2	Name, address and phone number of any agent, architect, engineer and planner
	4.3	Compete legal description of the property
	4.4	Future land use designation, current zoning and existing land use of the property and all abutting properties
	4.5	Total acreage of the property (square footage if less than two acres)
	4.6	Total # of dwelling units, by bedroom size; square footage of nonresidential uses by type of use (and/or seating, etc. as necessary to indicate the intensity)
	4.7	Number of off-street parking spaces provided (including handicapped spaces) and loading spaces and the calculation of, and basis for, the number of such spaces required by the Land Development Regulations
	4.8	Impervious surface calculations showing: the square footage and as a% of the total site for existing impervious surfaces, additional proposed impervious surfaces and the resulting proposed total impervious surfaces

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Department of State / Division of Corporations / Search Records / Search by Entity Name /

Detail by Entity Name									
	Foreign Limited Liability Company								
WESTLAKE ROYAL ROOF	FING LLC								
Filing Information									
Document Number	M9800000264								
FEI/EIN Number	33-0769563								
Date Filed	03/04/1998								
State	DE								
Status	ACTIVE								
Last Event	LC AMENDMENT AND NAME CHANGE								
Event Date Filed	02/22/2022								
Event Effective Date	NONE								
Principal Address									
2801 Post Oak Boulevard									
Suite 600									
HOUSTON, TX 77056									
Changed: 05/18/2022									
_									
Mailing Address									
2801 Post Oak Boulevard Suite 600									
HOUSTON, TX 77056									
Changed: 05/18/2022									
Registered Agent Name & A	Address								
NRAI SERVICES, INC									
	1200 South Pine Island Road								
Plantation, FL 33324									
Name Changed: 12/14/201	1								
Address Changed: 12/14/2	2011								
Authorized Person(s) Detail									
Name & Address									
Name & Address									
Title Manager									



September 13, 2023

To the City of Okeechobee, Florida

I, Derrick Cyprian, Vice President of Westlake Royal Roofing LLC ("Company"), formally known as Boral Roofing LLC, do hereby confirm that Christopher Hedrick, Senior Project Manager, is authorized to act for and on behalf of the Company for matters related to lot combination and city permits for the Company property located at 1289 NE 9th Avenue, Okeechobee, Florida 34972 and 858 Northeast 12th Street, lot 3 Okeechobee, FL 34972, and lots 1 and 2 as recorded in Plat Book 7, Pages 10-14 of the Public Records of Okeechobee County, Florida, including signing all forms and other documents related to such matters.

This authorization is valid until the Company provides further written notice.

Sincerely,

Juch Cype-

Derrick Cyprian Vice President Westlake Royal Roofing LLC 713-960-9111

STATE OF TEXAS	§
COUNTY OF HARRIS	§

On this 14 day of September 2023, before me, the undersigned officer, personally appeared Derrick Cyprian, who acknowledged himself to be the Vice President of Westlake Royal Roofing LLC and further acknowledged that he is authorized to execute this instrument as the act and deed of such limited liability company for the purposes contained herein.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this _ day of September, 2023.

07/2026

RAQUEL DOLORES MONTERO Notary Public, State of Texas Comm. Expires 09-07-2026 Notary ID 125604292

My Commission Expires: 🥑

tary Public in and for the State of Texas

Print Name of Notary Public

2801 Post Oak Blvd., Ste. 600 I Houston, Texas 77056 I T. 713.960.9111

www.WestlakeRoyalBuildingProducts.com



Official Records File#2023010406 Page(s):2 Jerald D Bryant, Clerk of the Circuit Court & Comptroller Okeechobee, FL Recorded 9/5/2023 2:53 PM Fees: RECORDING \$18.50 D DOCTAX PD \$0.00



Official Records File#2023010073 Page(s):2 Jerald D Bryant, Clerk of the Circuit Court & Comptroller Okeechobee, FL Recorded 8/25/2023 2:27 PM Fees: RECORDING \$18.50 D DOCTAX PD \$4,725.00

Prepared by and return to: This instrument prepared by: Debbie Salemme Title Pros of Florida, LLC 801 Northpoint Parkway Suite 79-80 West Palm Beach, FL 33407 (561) 277-0145 File No.: 2023-711

[Space Above This Line For Recording Data]

CORRECTIVE WARRANTY DEED

This Warranty Deed Made this 2/2 day of August, 2023 by MDC Industrial, LLC, a Florida Limited Liability Company hereinafter called the grantor, whose post office address is: 3553 SE Doubleton Drive, Stuart, FL 34997

to: Westlake Royal Roofing LLC, Foreign Limited Liability Company whose post office address is: 2801 Post Oak Boulevard, Suite 600, Houston, TX 77056 hereinafter called the grantee,

WITNESSETH: That said grantor, for and in consideration of the sum of \$675,000.00 Dollars, and other valuable considerations, receipt whereof is hereby acknowledged, hereby grants, bargains, sells, aliens, remises, releases, conveys and confirms unto the grantee, all that certain land situated in Okeechobee County, Florida, viz:

LOT 1, OF CITY OF OKEECHOBEE COMMERCE CENTER, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 7, PAGES 10 THROUGH 14, INCLUSIVE, OF THE PUBLIC RECORDS OF OKEECHOBEE COUNTY, FLORIDA Parcel Identification Number: 3-15-37-35-0020-00000-0010 AND

LOT 2, OF CITY OF OKEECHOBEE COMMERCE CENTER, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 7, PAGES 10 THROUGH 14, INCLUSIVE, OF THE PUBLIC RECORDS OF OKEECHOBEE COUNTY, FLORIDA. Parcel Identification Number: 3-15-37-35-0020-00000-0020 Parcel Identification Number: 3-15-37-35-0020-00000-0010

This property is not the homestead of the Grantor (s). ***Re-record to add correct Parcel control numbers for both lots***

TOGETHER with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining.

To Have and to Hold, the same in fee simple forever.

And the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good right and lawful authority to sell and convey said land; that the grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except taxes accruing subsequent to 12/31/2022, reservations, restrictions and easements of record, if any.

(The terms "grantor" and "grantee" herein shall be construed to include all genders and singular or plural as the context indicates)

IN WITNESS WHEREOF, Grantor has hereunto set grantor's hand and seal the day and year first above written.

Signed, Sealed and Delivered in Our Presence:

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i **MDC Industrial, LLC** B۱ Michael D. Craig, Managing Member

State of Florida County of Palm Beach

The foregoing instrument was acknowledged before me by means of physical presence or [] online notarization, this

day of August, 2023 by Michael D. Craig, Managing Member of MDC Industrial, LLC who [] is personally known or [] has produced a driver's license as identification.

[Seal]

SHANNON L. STOLZENFELD MY COMMISSION # HH 080338 EXPIRES: March 5, 2025 Bonded Thru Notary Public Underwriters

Print Name: ______ My Commission Expires: _

Notary Public



Official Records File#2020001678 Page(s):1 Sharon Robertson, Clerk of the Circuit Court & Comptroller Okeechobee, FL Recorded 2/17/2020 10:39 AM Fees: RECORDING \$10.00 D DOCTAX PD \$2,660.00

THIS INSTRUMENT PREPARED BY AND RETURN TO: John E. Burdeshaw Lake Okeechobee Title Inc. 425 SW Park Street Okeechobee, FL 34974 Property Appraisers Parcel Identification (Folio) Numbers: 3-15-37-35-0020-00000-0030

SPACE ABOVE THIS LINE FOR RECORDING DATA

WARRANTY DEED

THIS WARRANTY DEED, made the 14th day of February, 2020 by MDC Industrial, LLC, A Florida Limited Liability Company, whose post office address is 3553 SE Doubleton Drive, Stuart, FL 34997 herein called the grantor, to Boral Roofing LLC, A Delaware Limited Liability Company whose post office address is 200 Mansell Court East Suite 305, Roswell, GA 30076, hereinafter called the Grantee:

(Wherever used herein the terms "grantor" and "grantee" include all the parties to this instrument and the heirs, legal representatives and assigns of individuals, and the successors and assigns of corporations)

W I T N E S S E T H: That the grantor, for and in consideration of the sum of TEN AND 00/100'S (\$10.00) Dollars and other valuable considerations, receipt whereof is hereby acknowledged, hereby grants, bargains, sells, aliens, remises, releases, conveys and confirms unto the grantee all that certain land situate in OKEECHOBEE County, State of Florida, viz.:

Lot 3 CITY OF OKEECHOBEE COMMERCE CENTER, according to the plat thereof as recorded in Plat book 7, pages 10 through 14, public records of Okeechobee County, Florida

Subject to easements, restrictions and reservations of record and to taxes for the year 2020 and thereafter. None of which are intended to be reimposed hereby.

TOGETHER, with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining. TO HAVE AND TO HOLD, the same in fee simple forever.

AND, the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good right and lawful authority to sell and convey said land, and hereby warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except taxes accruing subsequent to December 31, 2019.

IN WITNESS WHEREOF, the said grantor has signed and sealed these presents the day and year first above written.

Signed, sealed and delivered in the presence of:

Paul Burdes 1 Signature

Witness #1 Printed Name -2 Witness #2 Signature

Jour E Burests Witness #2 Printed Name

MDC Industrial, LLC, A Florida Limited Diability Company M. M. (march

Michael D. Craig, Member

STATE OF FLORIDA COUNTY OF OKEECHOBEE

The foregoing instrument was acknowledged before me this 14th day of February, 2020 by Michael D. Craig Member of MDC Industrial, LLC, A Florida Limited Liability Company on behalf of the company. He is personally known to me or has produced ______ as identification.

SEAL



JOHN E BURDESHAW Commission # GG 108759 Expires September 25, 2021 Bonded Thru Budget Notary Services

Notary Signature

Printed Notary Signature

My Commission Expires:

Okeechobee County Property Appraiser Mickey L. Bandi, CFA

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Okeechobee County Property Appraiser Mickey L. Bandi, CFA

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Chapter 1 – STORMWATER MANAGEMENT DESIGN SUMMARY

- 1.1 Objective
- 1.2 Project Summary
- 1.3 Vertical Datum Reference
- 1.4 Floodplain
- 1.5 Water Quality & Quantity
- 1.6 On-Site Drainage Basins

Chapter 2 - CALCULATIONS

- 2.1 Remaining Storm Water Management Areas to be Constructed
- 2.2 Basin Information
- 2.3 Dry Pre-Treatment Calculations

Appendix A – MAPS

Exhibits

Appendix B – SUPPORTING DOCUMENTATION

Geotechnical Report

Santos Medina III, P.E.	This item has been digitally signed and sealed by the engineer
Florida Registration #74539	on the date indicated hereon. Printed copies of this document
Sloan Engineering Group, Inc.	are not considered signed and sealed and the signature must
P.O. Box 253	be verified on any electronic copies.
Bartow, Florida 33831 Certificate of Authorization #26247 (863) 800-3046	•





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This application for an Environmental Resource Permit (ERP) requests the construction and operation authorization of a stormwater management system serving 8.31 acres of industrial development (outdoor storage yard facility). This industrial development will be located on parcels 3-15-37-35-0020-000000-0030, 3-15-37-35-0020-00000-0020 and 3-15-37-35-0020-00000-0010. The subject site is within an existing industrial park. Lot 3 recently obtained ERP #47-108253-P. This industrial park has an existing ERP Permit #47-00638-P. The total basin area of the industrial park is 117.78 acres. This parcel as part of Basin 5 and 6, is allowed 90% impervious area (50% building and 40% pavement) and is required to provide $\frac{1}{2}$ " of pre-treatment before discharging to the master wet detention storm water system.

A portion of the project is proposed to be constructed in a future phase. Refer to construction plans for locations. According to staff coordination, recent aerials, obtainable as-built record drawings, permitting history and partial certifications, there is sufficient storm water management constructed to service the subject site. All premaster permit wetlands are up to date in their monitoring periods and are preserved per the master permit. No additional wetland modifications are included with this permit. Per coordination with city staff, a breakdown table of the Remaining Storm Water Management Areas to be Constructed is included (See Table 2.1).

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This application requests the construction of an outdoor storage yard facility, which includes the following: 5.958 acres of pavement and 1.114 acres of dry pre-treatment. The project proposes multiple entrances to NE 12th Street and NE 9th Avenue. Landscaping is proposed along the parcel perimeter. Building/parking improvements and additional outdoor storage area are to be constructed in a future phase.

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The elevations are referenced to the North American Vertical Datum of 1988 (navd'88) and are based on Florida Department of Transportation published control mark "BM Z2" with an elevation of 26.85 feet. (NAVD'88 + 1.217' = NGVD'29)

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According to FEMA Flood Insurance Rate Map (FIRM) # 12093C0415C (07/16/2015), portions of the subject property fall within Flood Zone "X"-Area of Minimal Flood Hazard and Flood Zone "X"-0.2% Annual Chance Flood Hazard.

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Water quality pre-treatment will be provided via a storm water ponds located along the project perimeter. Information on the ponds is provided in Chapter 2 of this report.



This project also includes implementation of a Stormwater Pollution Prevention Plan as additional reasonable assurance of compliance with water quality criteria during construction and operation.

The project is within Basin 5/6 of the approved land use and site grading assumptions from the design of the master stormwater management system. Therefore, the stormwater management system has not been designed to limit discharge for the design event to a specified rate. Existing basin and subject site information have been provided in the table below.

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There are seven (7) post-development basins. See Appendix A for the post development basin map. The subject site is to have stormwater runoff routed to the existing master stormwater system.





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Hchu ^{**}	117.78%	100.0%	≈44.39	37.7%	
6i]`X]b[`	34.36	29.2%	4.35	12.7%	
FcUXg#DUf_]b[[·] #DUj YX 5fYU [·]	32.49	27.6%	24.43	75.2%	Note: Constructing more paved areas creates more storage of surface waters
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@U_Yg	4.49	3.8%	4.09	91.1%	0.4 acres (portion of Water Management Tract L-2)
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V[cæa∲Áa[]^¦çáa[`∙Ásek^æa∮M ÃÁÖÔO00EÁų¦¦Á&[}dáa`cáj≭Ásek^æáM		Î∋ĒĒ ÂĬÈLĨÂ]	
KY][∖hYX'7ifjY'BiaVYf.	ÌÍĔ́IÌ €ÈÌÍ	М	-+	

Bch¥g.

EÁCE[Á\$J-{ | { 266ā] } Á\$v Á^~\^} & & åÁ;[{ Á/ÜÉ Í ÉÁN à 26) Á? å | [| [* ^ Á{; | ÁÙ { 26| Á/ 262^ !• @ å• ÉÛ/^8(; } å ÁÒåããā; } ÉAX` } ^ ÁF; J Ì Ì Á

FÁÚ[[¦Á&[}åããą]}ÁÇ&[ç^¦Á⊥̀à Á[¦Á@:æça[îÁt¦æ ^åD

GÁ/2æááÁ&[}åãaấ[}Á¢&[ç^¦ÁÍ€ÃÁ{[ÁÍÍÃÁ[¦Á][ơÁ@/æçã[Á′¦æ ^åD

HÁÕ[[åÁ&]}åãaā]}ÁĢ&[ç^¦ÁNÏÍÁà Á[¦Áðã@a]^Á'¦æ ^åD

IÁÜ[æå, æੰÁ&[ç^¦Ácî]^●Á\$J&|ĭå^Áðt@d‡[~Ë;æî

ÍÁU]^}ÁÙ]æ&^Á&[ç^¦Ácî]^•Á\$J&|čÅfæç}}•ÉÅJad\•É*[|-Á&[č]+^•ÆAc&È

7 i fjY'Bia VYf'7ƯWi`Uhjcb C_YYW(cVYY`@chi%#8# žG9; '>cV`_G9; '_&+&%

5 "6 Ug]b. +\$\$

6 "HcHU'5 fYU'fUWL &"- \$*

7 "7 i fj Y Bi a VYf.

7 cjYf HmdY	7 cbX] hj cb	Gc]∵; fcid	7B	5 fYU	DfcXiWh
		Ú^¦çąį́`•ÁŒ^æ	,		
U] ^} Ù] æ&^	Õ[[å	Ö	Ì€	€ÈFÏ	JÈĤ€
		₽,]^¦çãį`•ÁŒ^a	9		
Q;]^¦çãį`∙	Ùdॄ¦{, æe∿¦Á/UÓ	Œ	F€€	€ÉĞ	͌π€
Q;]^¦çāį̃`∙	Óٽą̃åą̃,*ĐTãr&È	Œ	JÌ	€È€€€	EEEE
Q(]^¦çāį̃∙	Úæç^{ ^}œÔ[}&È	Œ	JÌ	GÊGÎ G	GGFÈËÏÎ

GÈ€Î

GÈEÎ ĠHËHÍ Ù { K

-,

V[cæa¦Áā[]^¦çā[`∙Áæe'^æa/M ÃÁÖÔODEÁ[¦Á&[}däa`cāj*Áæe'^æa/M		GHÉIG IIÈII	
KY][∖hYX'7ifjY'BiaVYf.	<u>Ġ</u> HĚĤ	М	

KY][\hYX'7ifjY'BiaVYf.

Bch¥g.

EÁCE[Á\$J-{ | { azaī, } Á\$#Á^-^\^} & a Á; [{ Á/ÜÉ Í ÉÁV, à a) Á? å; [|[* ^ Á; | ÁÙ { a‡|Á/ aze^; • @ a · ÉÛ/^8; } a ÁÒ à ãaī; } ÉAX` } ^ ÁFJÌÎÁ

FÁÚ[[¦Á&[}åãaã[}ÁQ&[ç^¦Á⊾Í€ÃÁ[¦Á@/æçã[Á*¦æ^åD

GÁ 20aaā Á&{} åãaāį} ÁQ&{ ç^¦Ái€Ã Áq[ÁiÍà Á¦¦Á;[óÁ@) æçã; Á¦æ ^åD

HÁÕ[[åÁ&[}åããā[}ÁQ&[ç^¦ÁNIÍÍÃÁ[¦Áãã@q¦Á'¦æ^åD

ΙÁÜ[æå, æੰÁ&[ç^¦Áĉ]^•Á§J&|ĭå^Á∄ã@dĘ –Ė;æ

ÍÁU]^}ÁÙ]æ&^Á&[ç^¦Áĉ]^•Á\$J&|čå^Áæç}+ÊÅjæ\\•ÊK[|-Á&[覕^•ÊA\c&È

ÎÁÚæ•č¦^Á&[ç^¦Áĉ]^•Á\$J&|čå^Áť¦æ•|æ)å•Áį¦Áæ)*^•



<u>&" 8fmDfY! HfYUha Ybh7 U`W` Uhcbg</u>

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DcbX. %\$\$

	9`Yj Uhjcb	5 f YU f 2 ŕt	5 fYUfUWL
Hcd	GGÈE€	GÊÌÏ	€È€ÍÏ
7 cblfc`	GEÈEE	FHG	€È€H
7 CDITC	GEEEE	FIG	EEE
GH5;9	89DH<	JC@A9	JC@A9
fØŁ	fØłŁ	fBhŁ	fLWZŁ
G€È€€	€Ė€€	€	EEEE
G€ÈÉÏ	€È€Ï	FG	€È€€€
G€ÈFI	€ÈI	HF	€È€€F
G€ÈGF	€ÈF	ÍÍ	€È€€F
G€ÈGJ	€ÈGJ	ÌÎ	€È€€G
G€ÈĤ	€ÌĤ	FGG	€È€€H
G€ÈH	€ÈH	FÎ Í	€È€€
G€ĽÉ€	€Ľ€	GEH	€È€Í
G€ĒĽÏ	€ĚÏ	GÎÌ	€È€Ê
G€ĒÎI	€ḖI	HĜ	€È€È
G€ËF	€ËF	ЫÍ	€È€€J
G€ËJ	€ËJ	ΙÎΪ	€È€FF
G€ÈÎ	€ÈÎ	ÍIÎ	€È€FH
G€ÈH	€ÈH	ÎH€	€È€FI
GFÈ€€	FÈ€€	ÏŒ	€È€FÏ
GFÈEÏ	FÈ	ÌFÏ	€È€FJ
GFÈI	FÈ	JG€	€È€GF
GFÈGF	FÉGF	FÊ€GÎ	ۃEG
ŒĒJ	FÉGJ	<u> </u>	€ÉÉĞÎ
ŒĤ	FÈĤ	FÊGÎ I	€É€GJ
GFÈH	FÈ H	FÊU€	ۃEHG
GFĚ€	FÉ€	FÉGH	€È€HÍ
ŒĔÏ	FĚÏ	FÊÎF	€È€HÌ
GFÊl	FÊI	FÊ€Î	€ÈEIF
GFË F	FËF	FÊÍÎ	€ÈEIÍ
GFË J	FËJ	GÊFH	€ÈEIJ
GFÈÎ	FÈÎ	GÊGIÎ	€ÈÉÍG
GFÈH	FÈH	GÊLI	
GGÈ€€	GÈ€€	GĒ FJ	€É΀
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	ε <u>;</u> ^}υ=κ[n=κ /¦^æe{ ^}αÂÔ ^çK	GFÈEJ	
ia;∧U^ be∖	vi^æt(^}040 ^^ÇK	GEI	<u>~</u>
		~c ^H	æŝËc
Ú¦[cãå^åÁ	/¦^æe{ ^}oÁX[K	FÉGH	€È€HÍ
Y ^ãÁÖ^∙ã	AQIAcK	GFĔ€	÷
			<u> </u>

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Required Treatment Volume

Basin Area x 0.5" 0.467 ac x 0.5" = 848 cf

DcbX. &\$\$

	9`Yj Uhj cb	5 f YU f B rît	5 fYU f UVL
Hcd	GGÈ€€	GÊ€Í F	€È€IÏ
7 cblfc`	GEÈEE	F€Î	€È€€G
	GEEE	Γŧ	ELEEU
GH5;9	89DH<	JC@A9	JC@A9
fØłŁ	fØŁ	fZhŁ	fLWZŁ
G€È€€	€È€€	€	€Ê€€€
G€ÈEÏ	€ÈËÏ	F€	€È€€€
G€ÈFI	€ÈI	Ğ	€È€F
G€ÈF	€ÈF	ΙÍ	€È€F
G€ÈGJ	€ÈGJ	Ï€	€È€€G
G€ÌĤ	€ÌĤ	F€€	€È€€G
G€ÈH	€ÈH	FHÍ	€È€H
G€ĽÉ€	€Ľ€	FΪ Í	€È€€
G€ÉÏ	€ĚÏ	ŒIJ	Ê
G€ÊI	€ĒI	Ĝ Г	€È€Î
G€EËF	€ËF	HG	€È€
G€ĒĽJ	€ËJ	НÌН	€Ì€€J
G€ÈÎ	€ÈÎ	111	€Ì€F€
G€ÈH	€ÈH	Í FÌ	€È€FG
GFÈ€€	FÈ€€	ÍJG	€È€FI
GFÈEÏ	FÈ€Ï	ÎÏG	€È€FÍ
GFÈI	FÈFI	ΪÍÎ	€È€FÏ
ŒÈF	FÈGF	ÌIÎ	€È€FJ
ŒÈU	FÈGJ	JI€	€È€CG
ŒĤ	FÈĤ	FÊ€HJ	€È€G
GFÈH	FÈH	FÊFII	€È€GÎ
GFĚ€	FĚ€	FÊGÍ H	€È€GJ
GFĚÏ	FĚÏ	FÊHÎÏ	€ÈEHF
GFÊI	FÊI	FÊÌÏ	€È€H
GFË F	FËF	FÊ FF	€È€HÏ
GFËJ	FËJ	FḖI€	€È€I€
GFÈÎ	FÈÎ	FÊÏI	€È€IH
GFÈH	FÈH	GÊ€FH	€È€IÎ
GGÈ€€	GÈ€€	GÊÉÍÏ	€ÈÉÍ€
			4
"		÷	æ\$Ë€
U^ĭ EV¦^æ	ɛ{ ^} œ́X[ká	FÊG΀	€È€GJ
Tậ, ÁÜ^≚ĒÁ	/¦^æe{ ^}04Ô ^çK	GFÉ€	÷
		$\mathbf{\hat{v}}^{\mathrm{H}}$	æ
Ú¦[çãå^åÁ	/¦^æe{ ^}œÁK[K	FÊ FÍ	€È€HG
Y ^ãÁÖ^∙ã	í}ÂÒ ^çK	ŒÊ€	÷

Required Treatment Volume

Basin Area x 0.5" 0.694 ac x 0.5" = 1,260 cf

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DcbX. '\$\$

	9`Yj Urj cb	5 f YU f B rt	5 fYU f LWL
Hcd	GGÈ€€	FÊ JÏ	€È€H
7 cblfc`	G€È€€	ΪΗ	€È€€G
	CELEC	111	CLEOU
GH5;9	89DH<	JC@A9	JC@A9
fØłŁ	fØŁ	fZhŁ	fLWZŁ
G€È€€	€È€€	€	€Ê€€€
G€ÈEÏ	€ÈËÏ	Ï	€È€€€
G€ÈFI	€ÈI	FÌ	€È€€€
G€ÈGF	€ÈF	HG	€Ì€€F
G€ÈGJ	€ÈGJ	Í€	€È€F
G€ÈĤ	€ÌĤ	ΪF	€È€€G
G€ÈH	€ÈH	JÏ	€È€€G
G€ĽÉ€	€Ľ€	FĜ	€È€H
G€ĒĽÏ	€ĚÏ	FÍÌ	€È€€
G€ĒÎI	€ĒI	FJI	€È€€
G€ËF	€ËF	Э	€È€É
G€ËJ	€ËJ	ĠÏ	€È€Ê
G€ÈÎ	€ÈÎ	HG	€È€Ë
G€ÈH	€ÈH	ΗΪÍ	€È€€J
GFÈ€€	FÈ€€	١G	€Ì€F€
ŒÈ	FÈ	ΙÌΪ	€È€FF
GFÈI	FÈI	ÍIÌ	€È€FH
GE	FÈF	ÎFI	€È€FI
GFÈGJ	FÈGJ	ÎÌG	€È€FÎ
ŒĤ	FÈĤ	ÏÍÍ	€È€FÏ
GFÈH	FÈH	ÌHF	€È€FJ
GFĚ€	FĚ€	JFF	ۃEGF
GFĚÏ	FĚÏ	JJI	ۃEGH
GFÊI	FÊl	FÊEÌ F	ۃEG
GFË F	FËF	FÊFÏF	€È€GÏ
ŒËJ	FËJ	FÊĞÎÎ	€È€GJ
GFÈÎ	FÈÎ	FÊĤĤ	€ÈF
GFÈH	FÈH	FÊÎÍ	€È€H
GGÈ€€	GÈ€€	FÉÏ€	€ÉÉHÍ
			æsëc
<i>□</i> ∧˘Ė́λ/\∧~	ɛ{ ^} ơÁX[KÁ	ۍ ۱ (ل	€È€GH
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		÷ ₽	æ
Ú¦[çãå^åÁ	/¦^æe{ ^}oÁX[K [}ÁÔ ^çK	FÊ€GJ	€È€G
Y ^ã,∕Ö^∙ã	t}ÁÔ ^çK	GELĒ€	÷
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Required Treatment Volume

Basin Area x 0.5" 0.542 ac x 0.5" = 984 cf

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DcbX. (\$\$

	9`Yj Uhj cb	5 f YU f B ໣	5 fYU fUWL
Hcd	GGÈE€		€ÈHÏ
	GEEE	HÎ	EFA
7 cblfc`	GEIEEE		EEE
GH5;9	89DH<	JC@A9	JC@A9
fØŁ	fØłL	fZhŁ	fLWZŁ
G€È€€	€È€€	€	EEEE
G€ÈEÏ	€ÈË	HF	€È€€F
G€ÈI	 €ÈI	ΪΪ	€È€€G
GEÈF	€ÈF	FHÏ	€È€H
G€ÈGJ	 €ÈGJ	GFF	E
G€ÈĤ	€ÌĤ	H€€	€È€
G€ÈH	€ÈH	I€H	€È€J
G€Ľ€	€Ľ€	ÍG€	€È€FG
G€ÉÏ	€ĚÏ	ÎÍG	€È€FÍ
G€ĒÎI	€ĒI	ÏJÌ	€È€FÌ
G€ËF	€ËF	JÍÌ	€È€CG
G€ËJ	€ËJ	FÊHH	€È€GÎ
G€ÈÎ	€ÈÎ	FÊHGG	€È€H€
G€ÈH	€ÈH	FÉG	€È€HÍ
GFÈ€€	FÈ€€	FÊIJ	€€€
ŒÈ	FÈ€Ï	FÊÏÎ	€È€IÍ
GFÈI	FÈFI	GÊGH	€È€ÍF
ŒÈF	FÈGF	GÊÌI	€È€ÍÏ
ŒÈJ	FÈGJ	GĒÍJ	€È€ÎH
ŒĤ	FÈĤ	HÊ€IJ	€ÈËÏ€
GFÈH	FÈH	HÊHÍH	€ÈEÏÏ
ŒÉ€	FĚ€	HÊÎF	€ÈÈÌI
GFĚÏ	FĚΪ	IÊ€€	€È€JG
GFḖI	FÊ I	I ÊHÍ F	€È€€
GFË F	FËF	I Ḗ FH	€È€Ì
ŒĒIJ	FËJ	ÍÊEÌJ	€ÈFÏ
ŒÈÎ	FÈÎ	ÍÊÏJ	€ÈGÎ
ŒÈH	FÈH	ÍÊÌI	€ÈFHÍ
GGÈ€€	GÈ€€	ÎÊH€H	€ÈFIÍ
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Ü^ĭË∛¦^æ	ɛ{ ^} œ́X[ká	FÊG	€È€HÏ
Tậ, ÁÜ^≚ĐĂ	/¦^æe{ ^}0ĤO ^çK	GEÈÎ	÷
		~€ ^H	æËc
	/¦^æa{ ^}oÁX[K	HÊÏF	€ÈÈÌI
Y ^ãÁÖ^∙ã	í}ÂÔ ^çK	GFĚ€	÷

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Required Treatment Volume

Basin Area x 0.5" 0.895 ac x 0.5" = 1,624 cf

FYhYbhjcb'GhU[Y!GhcfU[Y'/ 'HfYUha Ybh'9`YjUhjcb C_YYW[cVYY'@ch%8# žG9; '>cV' [G9; ' &+&%

DcbX.)\$\$

		E 63.0 1 617.84	5 fYUfUWL
l la d	9`YjUh]cb G€Ĕ€	5 f YU f Z hůt Í ÉGGH	€ÈG€
Hcd	-		-
7 cblfc`	FJÈ€€	GÊ€€€	€È€IÎ
GH5;9	89DH<	JC@A9	JC@A9
fØŁ	fØŁ	fZhŁ	fLWZŁ
FJÈ€€	€ Ř€ €	€	EEEE
FJÉ	ۃ	 FF€	€€€EH
FJÈF	€ÈF	GÄ	€€€€
FJÈÎ	 €ÈÎ	H J	€È€È
FJÉF	€ÈF	111	€È€FF
FJÉG	€ÈGÏ	ÎFH	€È€FI
FJÈHG	€ÈG	ΪĺΙ	€È€FÏ
FJÈ	€ĤÏ	J€F	€È€GF
FJÈH	€ÈH	FÊ€Í I	€È€G
FJÈÌ	€ÈÌ	FÊGFI	€È€GÌ
FJĚI	€ĚI	FÊĤ€	€È€HG
FJĚJ	€ĽÍJ	FÉÍG	€Ì€HÎ
FJḖI	€ËI	FḖH€	€È€I€
FJË€	€Ë€	FÊFI	€È€II
FJËÍ	€ËÍ	GÊ€	€ÈEIÌ
FJÈ€	€Ì€	GÊH€F	€ÈÉÍH
FJÈÎ	€ÈÎ	GÉÉ€	€ÈÉÍÏ
FJÈF	€ÈF	GĒ FG	€ÈÉÎG
FJÈÎ	€ÈÎ	GÊGÌ	€ÈÉÎÏ
G€È€G	FÈ€G	HÊFIJ	€ÈEÏG
G€È€Ï	FÈEÏ	HÊHÎÎ	€ÈEÏÌ
G€ÈEH	FÈFG	HÊÎF€	€ÈÈÌH
G€ÈÈÌ	FÈÌ	HÊIJ	€ÈÈÌÌ
G€ÈCH	FÈGH	I Ê€JÍ	€È
G€ÈGJ	FÈGJ	ΙÊΗΪ	€È€€
G€ÈH	FÈH	IḖ€Î	€È€Î
G€ÈHJ	FÈIJ	IÊÏ€	€ÈFG
G€ÈÍ	FÈÍ	ÍÊHF	€ÈFÌ
G€ĽÉ€	FĚ€	ÍÊFÏ	€ÈG
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		€	æsëc
Ú¦[çãå^åÁ	/¦^æe{ ^}oÁX[K	HÊEÏÍ	€ÈEÏF
Y ^ãÁÖ^∙ã	í} ÁÒ ^çK	G€È€€	÷

Required Treatment Volume

Basin Area x 0.5" 1.033 ac x 0.5" = 1,875cf

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FYhYbhjcb[·]GhU[Y!GhcfU[Y'/ [·]HfYUha Ybh'9`YjUhjcb C_YYW/cVYY[·]@ch%## žG9; [·]>cV[·]_.G9; [·]_.&+&%

DcbX. *\$\$

	9`Yj Uhjcb	5 f YU f Z ŕt	5 fYƯf L₩L
Hcd	G€È€€	ÌÊĤÌ	€ÈJG
7 cblfc`	 FÌ Ě€	HÊGÍÍ	enenenenenenenenenenenenenenenenenenen
7 CDITC	ΓIŒ€		
GH5;9	89DH<	JC@A9	JC@A9
fØŁ	fØŁ.	fBhŁ	fLWZŁ
FÌĖ€	€È€€	€	€È€€€
FÌĚÍ	€ÈÉÍ	FΪJ	€È€€
FÌĒF	€ÈF	HÎÌ	€È€È
FÌĒÎ	€ÈÎ	ÍÎÏ	€È€FH
FÌËF	€ÈGF	ΪΪÎ	€È€FÌ
FÌËÏ	€ÈGÏ	JJI	€È€GH
FÌÈG	€ÈG	FÉGG	€È€GÌ
FÌÈÌ	€ÌĤ	FÊ΀	€È€H
FÌÈH	€ÈH	FḖ€Ì	€È€HJ
FÌÈÌ	€ÈÌ	FÊÎÎ	€ÈEIÍ
FJÈ€I	€ĚI	GÊCHH	€ÈÉÍF
FJÈ€J	€ĽÍJ	GÉIF€	€ÈÉÍÌ
FJÈI	€ḖI	GĒLI	€ÈÊÍI
FJÈ€€	€Ë€	HÊ€JH	€ÈËÏF
FJÉGÍ	€ËÍ	HÊ€€	€ÈËÌÌ
FJÈH€	€È€	HÊÎFÎ	€ÈÈÍÍ
FJÈĤ	€ÈÎ	I ÊEI G	€È€JH
FJÈF	€ÈF	I Ĥ Ì	€È€
FJÈÎ	€ÈÎ	IĒG	€È€
FJĚG	FÈ€G	ÍÈEÏJ	€ÈFÏ
FJĚÏ	FÈEÏ	ÍÊII	€ÈGÍ
FJÊH	FÈG	ÍÊFJ	€ÈH
FJĒÌ	FÊ	ÎÊE	€ÈIG
FJËH	FÈGH	ÎÊJÌ	€ÈÍF
FJËJ	FÈGJ	ÏÊ€€G	€ÊÎF
FJÈI	FÈI	ÏÊFÎ	€ĒÏ€
FJÈJ	FÈU	ÏÊl€	€ÈÌ€
FJÐÍ	FÈÍ	ÌÊĞÏ	€ĒJ€
G€È€€	FĚ€	ÌḖFÏ	€È€€€
			æ
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	ɛ{ ^} œ́X[kÁ	FÊ€Î	€È€HÏ
Tậ, AJ^≚ EA	/¦^æe{ ^}ơÂÔ ^çk	K FÌÈF	<u>~</u>
		¢ ^H	æ
Ú¦[çãå^åÁ	/¦^æa{ ^}oÁX[K	HÊ€€	€ÈËÏÌ
Y ^ãÁÖ^∙ã	t}ÂÔ ^çK	FJÈG	÷

Required Treatment Volume

Basin Area x 0.5" 0.885 ac x 0.5" = 1,606 cf

Þ[c∿∙KÁ

FYhYbhjcb'GhU[Y!GhcfU[Y'/ 'HfYUha Ybh'9`YjUhjcb C_YYWIcVYY'@ch%88# žG9; '>cV' [G9; ' &+&%

_____,

DcbX. +\$\$

	9`Yj Uhjcb	5 f YU f B rt	5 fYU fUWL
Hcd	G€É€	GGÊĴÍI	€ĚĠ
7 cblfc`	FÌĚ€	FÍÊII	€ÌHÍÍ
GH5;9	89DH<	JC@ A9	JC@A9
fØłŁ	fØŁ	fZhł	fLWIZłŁ
FÌĔ€	€È€€	€	€È€€€
FÌĚΪ	€ÈË	FÊFH	€È€GÎ
FÌḖI	€ÈI	GÊGIÍ	€ÈÉÍG
FÌĖ̈́F	€ÈF	HÊHUÎ	€ÈEÏÌ
FÌËJ	€ÈJ	ΙÉÎÎ	€È€
FÌÈÎ	ÊĤ	ÍĒÍÍ	€ÈHG
FÌÈH	€ÈH	ÎÊÎI	€È΀
FJÈ€€	€Ľ€	ÌÊIJF	€ÈÌÌ
FJÈ€Ï	€ĚÏ	JÊH	€ÈFÏ
FJÈI	€Êl	F€Ē€	€ÈGIÎ
FJÈF	€ËF	FFÊÌ J	€ÈĠÏÍ
FJÈGJ	€ËJ	FHÊGJI	€ÌHÉÍ
FJÈĤÎ	€ÈÎ	FIĒFÏ	€ÌHÎ
FJÈH	€ÈH	FÍÊĴ΀	€ÌĤÎ
FJĚ€	FÈ€€	fï ÉHGG	€ÈUÌ
FJĚÏ	F	FÌḖ€G	€ÈGJ
FJĒI	FÈI	G€ÊÊ€H	€ÈÎF
FJË F	FÈGF	ŒÊG	€ÈIJ
FJËJ	FÈGJ	GGÊĴ΀	€ĽÍĠ
FJÈÎ	FÈĤ	GÊFÌ	€ĚÎF
FJÐH	FÈH	GÉJI	€ĽÍJI
G€È€€	FĚ€	ĞÊÛ€	€ĒGJ
G€ĒĒÏ	FĚÏ	ĠÊ€	€ÊÎI
G€ÈFI	FÊI	H€ÊI€	€ḖJJ
GۃGF	FËF	HFÊJH	€ËH
G€ÈGJ	FËJ	HHÉÎÍ	€ËÏF
G€ÈĤ	FÈÎ	HÉÉÍÏ	€È€
G€ÈH	FÐH	HÎÊÎÌ	€ÈII
G€ÉÉ€	GÉ€€	h Éui	€ÈÌF
			مع⊄ ت
		€ ÍÊGÏI	assec
	ɛ{ ^} ơÁX[kÁ /¦^æɛ{ ^} ơÁÔ ^çK		€ÈGF
Ia)AU^⊺EA	√¦^æe{ ^}040 ^çK	⊂ FÌĖ́H	÷
		÷	æsëc
Ú¦[çãå^åÁ	/¦^æa{ ^} 0ÁX[K	GGÊGI F	€Ě FF
Y ^ã∕Ö^∙ã	t}ÂÔ ^çK	FJËÍ	÷
			•

Þ[c∿∙kÁ

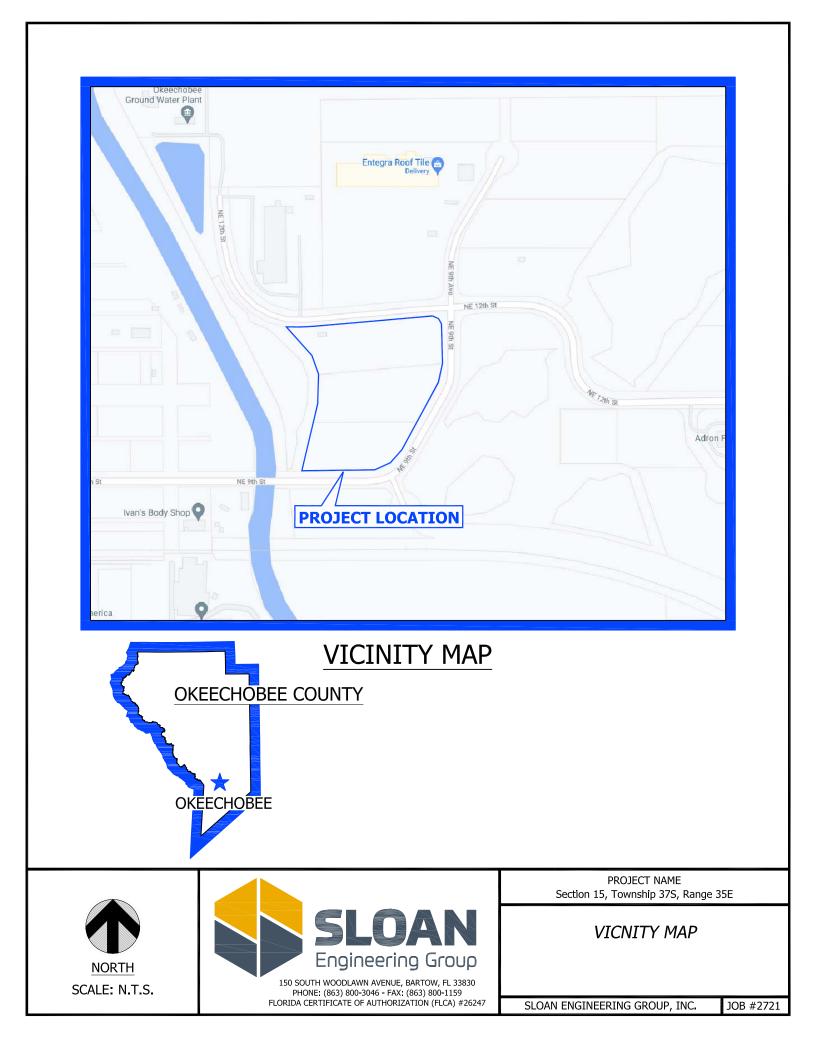
Required Treatment Volume

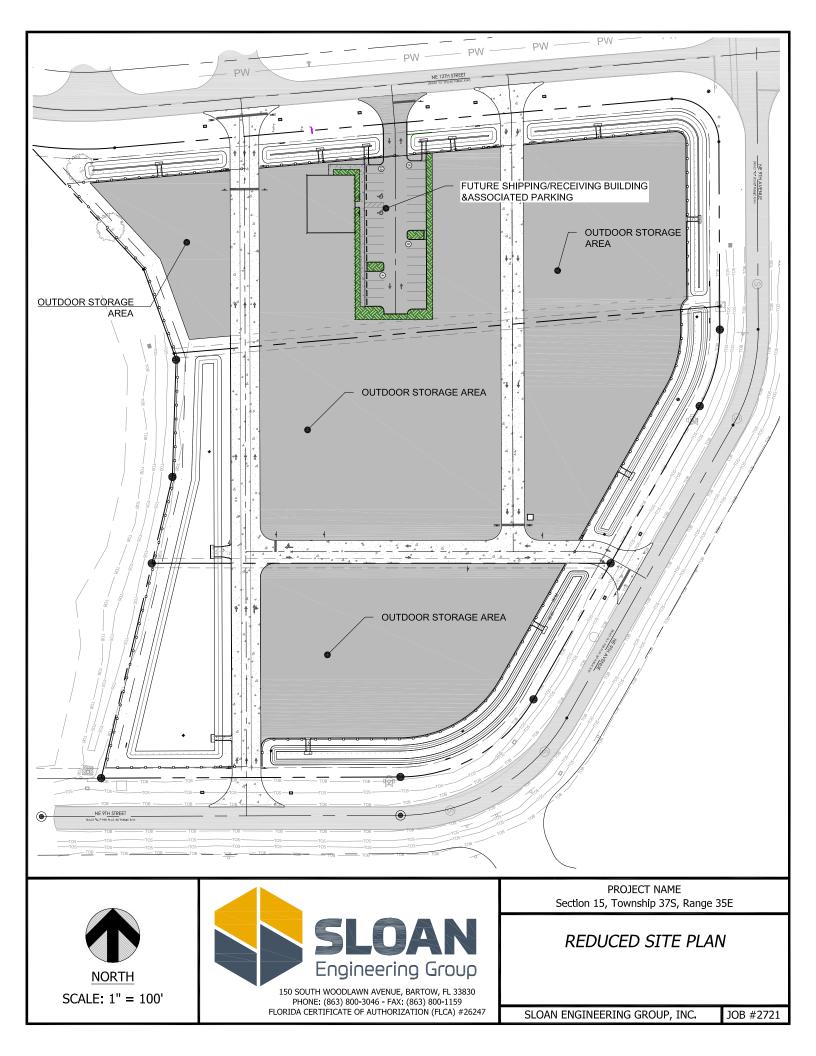
Basin Area x 0.5" 2.906 ac x 0.5" = 5,274 cf

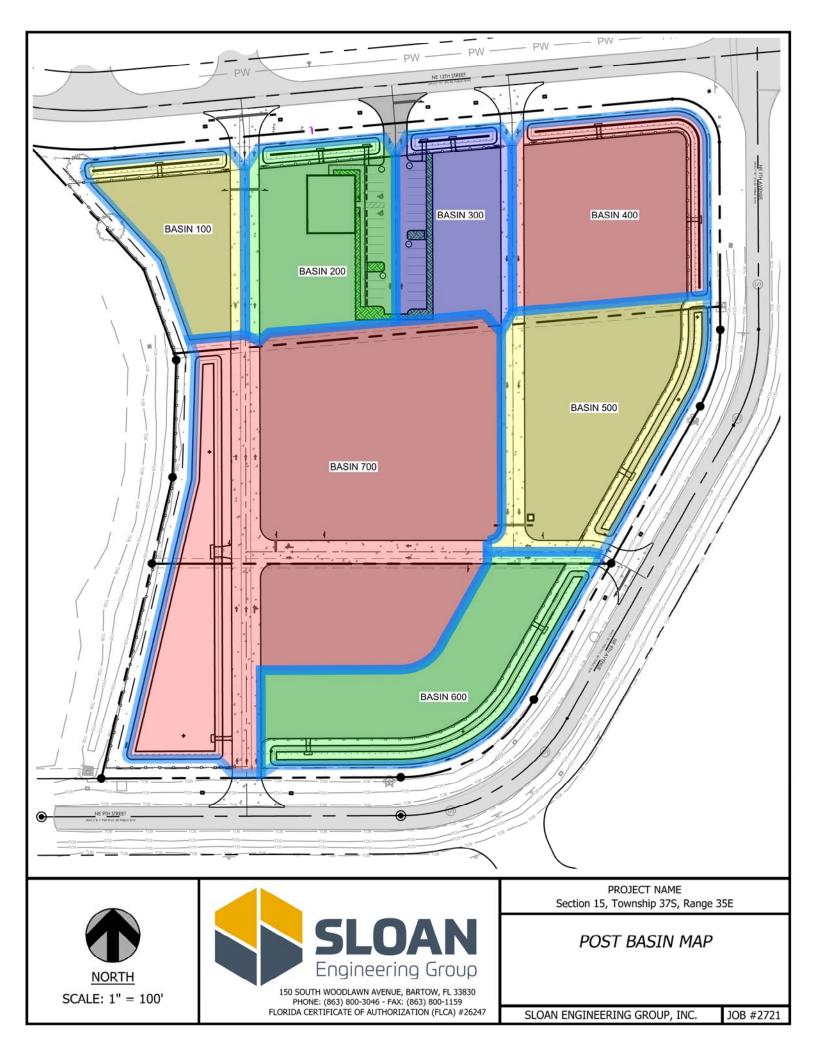


Maps















"I GQVGEJ PKECN'GPI KPGGTKPI 'UGTXKEGU'TGRQTV''

" RTQRQUGF 'Y GUVNCMG'TQ[CN'TQQHKPI '/'NC[FQY P'[CTF''

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"

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34: ; "PG"; ^{vj} "CXG0"

"

KO RGTKCN'RTQLGE V'PQ0482; 9"

••

"

Rtgr ctgf "hqt<"

UNQCP'GPI KPGGTKPI 'I TQVR''

 $CVVP \ensuremath{ \ \ } VVP \ensuremath{ \ \ } CVVP \ensuremath{ \ \ } CVVP$

RQ'DQZ'475.'DCTVQY.'HN'55: 53"

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or ct of 'd!

Rtgr ctgf "d{<"

KORGTKCN'VGUVKPI 'CPF'GPI KPGGTKPI.'KPE0'

5; 27''**MK**FTQP''TQCF''

NCMGNCPF. "HNQTKFC"55:33"

•• •• ••

Ugr vgo dgt '42.'4245"



5; 27"Msf tqp"Tqcf", "Nengrepf."HN"55: 33", ": 85/869/4: 99", "Hcz": 85/869/3992"

Ugr vgo dgt "42."4245"

"

"

"

Uncp'Gpi kpggt kpi 'I t qwr '' Cwp0t'O t0Cpf { 'O gf kpc''

RQ'Dqz''475.''Dctvqy .''HN''55: 53''

Tg<'</th>I gqvgej plecn'Gpi løggtkpi 'Ugtxlegu'Tgr qtv''
Rtqr qugf ''Y gumeng'Tq{ cnTqqhpi '/'Nc{f qy p'[ctf ''
34: ; 'P G'', 'j' 'Cxg0'Qnggej qdgg.''Qnggej qdgg'Eqwpv{.''Hnqtkf c'''''
Ko r gtkcn'Rtqlgev'P q0482; 9''

F gct 'O t0O gf kpc<"""

Korgtkn¹Vguvkpi "cpf "Gpi kpggtkpi ."Kpe0***Korgt kn²j** cu"eqorgvgf "y g"I gqvgej pkecn'Gpi kpggtkpi "Ugtxkegu" cwj qtk gf "hqt "y g"tghgtgpegf "rtqlgev0Kp"i gpgtcn'ceeqtf cpeg"y kj "qwt"rtqr qucn'f cvgf "Cwi wuv'5."4245."y g" rwtr qug"qh'qwt "i gqvgej pkecn'gzr mtcvkqp"y cu'vq "qdvckp"y g"i gpgtcn'uvduwthceg"f cvc"cv'y g"rtqr qugf "ukg"cpf " vq"gxcnwcy"ukg"uwkcdktk{ "hqt"y g"rtqr qugf "rtqlgev0Dcugf "qp"qwt"cpcn{uku"qh'y g"uwduwthceg"f cvc"qdvckpgf ." y g"f gxgmr gf "y g"ukg"rtgr ctcvkqp"wej pks wgu."cu"y gm'cu y g"gpi kpggtkpi "tgeqo o gpf cvkqpu"vq"i wkf g"y g" f guki p"cpf "eqpuvtwevkqp"qh¹*3+hqwpf cvkqpu"qh'y g"tqr qugf 'lij krr kpi "qhtkeg'dwkff kpi ."*4+i'rtqr qugf 'i cxgo gpwu" kp"y g"r ctnkpi "mv"qwf qqt"uvqtci g"ctgcu."cpf "kpvgtpch'tqcf u."cpf "*5+"y g"r tqr qugf "uvqto y cvgt"r qpf u0'Vj ku" tgr qtv'f guetkdgu"qwt"uvduwthceg"gzr mtcvkqp"rtqegf wtgu."uvoo o ctk gu"y g"f cvc"qdvckpgf ."cpf "rtquggf "rtqlgev0" "

Ký 'ý g'uqkil'guv'dqtkpi u'**Kó rgt kch**f tkngf 'cv'ý g'ukg. 'ugxgtcn'he { gtu'qh'*nqug'*iq*'o gf kwo 'f gpug*'hkpg''ucpf u'y gtg" gpeqwpygtgf 'htqo 'ý g'gzkukpi 'i tcf gu''q'ý g'o czko wo 'gzr nţtgf 'f gr ý 'qh'57/hv0Vj ku'tgr qtv'eqpvckpu'f gvckgf " ukg''r tgr ctcvkqp''r tqegf wtgu''q''eqo r cev'y g''*nqqug*''uqku''kp''y g''vqr/| qpg''d{ ''uvtkr kpi ''cpf '' tqqh/tqnkpi ''y g'' eqpuvt wevkqp'' ctgcu0' Vj g'' uqki' o qkuwtg'' eqpvgpv'' f wtkpi '' eqo r cevkqp'' uj qwrf '' dg'' eqpvtqngf .'' cpf '' y g'' tgeqo o gpf gf '' eqo r cevkqp'' r gtegpvci g'' uj qwrf '' dg'' xgtkhgf .'' cu'' f guetkdgf '' j gtgkp0' Rtqxkf gf '' y g'' tgeqo o gpf cvkqpu'qh'ý ku'tgr qtv'ctg' ko r ngo gpvgf .''y g'' rtqr qugf ''uj kr kpi ''qhkeg''dwkrf kpi ''eqwrf ''dg''uvr r qtvgf '' qp''c''o qpqnky ke/urcd/o cv'*O UO +''hqwpf cvkqp''f guki pgf ''hqt ''cp''cmqy cdng''dgctkpi ''ecr cek{ ''qh'4.222/r qwpf u'' r gt 'us wctg'hqqv*r uh+0Vj ku'tgr qtv'cnq''eqpvckpu'qwt 'tgeqo o gpf cvkqpu'hqt 'y g'' tqr qugf '' cxgo gpvu'cpf '' qpf u0'

Korgt kenⁱcrrtgekevgu''y g''qrrqtwpkv{ ''vq''ugtxg''y ku''rtqlgev'cpf ''twuvu''y ku'i gqvgej pkecn'gpi kpggtkpi 'tgrqtv'ku'' uwhhekgpv'hqt''rtqlgev'f guki p0'Hqt''cp{ ''s wguvkqpu'tgi ctfkpi ''y g''eqpvgpvu''qh''y ku'tgrqtv.''r ngcug''eqpvcev'wu0' ''

Upegtgn{." KorgtkcnlVgudpi 'cpf 'Gpi lpggtlpi.'Kpe0'

CrlOeI jkp" Rtgukfgpv"

"Al McGhin

"

Uck'Mcmwwtw.'R0G0P q0:: : 497" "



VCDNG'QHE QP VGP VU'

RTQLŒV"KPHQTOCVKQP A
RTQLGEV"UKVG"CPF"RTQRQUGF"EQPUVTWEVKQP1
I gqvgej pkecn'Crrtqcej1
Rwtrqug'cpf "Ueqrg'qh'Y qtm2
Uqky"Uwtxg["Tgxkgy
HKGNF'GZRNQTCVKQP'CPF'NCDQTCVQT['VGUVKPI'RTQITCO
I GQVGEJ PKECN"HKGNF "GZRNQTCVKQP "RTQI TCO
UJGND["VWDGU**UV+"HQT"NCDQTCVQT["RGT0GCDKNKV["VGUVKPI4
NCDQTCVQT["VGUVIP1"RTQITCO
UCORNG'T GVCIP CIG
UWDUWTHCEG'UQKN'CPF'I TQWPFYCVGT''VCDNG'*I YV+'EQPFKVKQPUA
Uwduwthceg'Uqkn'Eqpfk/qpu
I TQWPFYCVGT"VCDNG"41 Y V+"EQPFKVKQPU
GXCNWCVKQPU.'EQPENWUKQPU.'CPF'TGEQOOGPFCVKQPUA
How pfc vion 'Cpcn uku'cpf'' Ugvvngo gpv'Eqpuir gtc vion 1
HQWPFCVKQP'FGUKLP'TGEQOOGPFCVKQPU
UKVG'ENGCTKPI8
RTQQH/TQNNIPI8
Uvtwevwtcn"Hkn
F glkpkkqp A
Uvqtoycvgt"Rqpf"Eqpuffgtcvkqpu10
GZECXCVKQP "UCHGV[
RCXGO GP V'T GEQO O GP F C V KQP U A HIM
GZECXCVIQP 'UCHGV[
NKO KVC VKQP 'E QO O GP VUA
I GPGTCNE13
NKO KYCVKQP 'QH'VJ G'UEQRG'QH'UGTXKEGUÈ. 13
EJCPIGF"EQPFKWRQPUÈ14
TGRTQFWEVKQP
CEMP QY NGFI GO GP V

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CVVCEJ O GPVU'

"

Ukg'Nqecvkqp'O cr "
Ukg''Rrcp'y kj ''Vguv''Nqecıkqpu'''
Dqtkpi 'Nqi u''
WUFC/PTEU'Uqkti'Uvtxg{'Tgrqtv'
Wpkhkgf "Uqkn'Encuukhkecvkqp"U{uvgo '*WUEU+"/ 'Encuukhkecvkqp"cpf 'Eqpukuvgpe{ 'Ej ct u'"'''''



RTQLGEV' KP HQTO CVKQP''

Rt qlgev'Usg'cpf 'Rt qr qugf 'E qpuvt wevlqp''

Vj g'r tqlgevlukg'cpf 'ku'xkelpkv{ 'ctg'uj qy p'qp''j g'I qqi ng'o cr 'cwcej gf 'cu'**Hk** wt g'30Vj g'r tqr qugf ' δ Y guvcng'' Tq{cn'Tqqhkpi ''/'Nc{f qy p'[ctf "*Y TT/N[+ δ ''r tqlgev'y kn'ldg'f gxgnr gf ''qp''j g''uqwj ''ukf g''qh'PG'; '' 'Cxgpwg'' kp''c''pqt y gcuvgtp''uwdwtd''qh'Qnggej qdgg. ''Qnggej qdgg''Eqwpv{.''Hnqtkf c0'Vj g''ukg''ku''kp''y g''xkekpkv{ ''qh''xcecpv'' rcpf u 'tgukf gpvkcn'r tqr gt vgu ''cpf ''eqo o gtekcn'r tqr gt vgu''

Cu"r gt "ý g"r tgilo koct { "kphqto cvkqp"cpf "ukg"rc { qw/r tqxkf gf "vq"**Korgt kcn**'d { "O t0'Cpf { "O gf kpc."Rtqlgev' O cpci gt"qh'Uqcp"Gpi kpggtkpi 'I tqwr **'*Uqcp+.**'ý g'r tqr qugf "Y TT/N["r tqlgev'eqpukuvu"qh'c"pgy "uj kr r kpi " qhheg"dwkf kpi "y kj "cr r tqzko cvgn{"5.222/h⁴"r mp"ctgc"*cdqwi'72/h/'d{ "82/hv+."cuuqekvgf "r ctmkpi "mv'hqt" go r m{gglxkukqt"ect"r ctmkpi .'qwf qqt"uvqtci g'ctgcu "cpf 'kpvgtpcn'eqppgevkpi 'tqcf u0'Vj g''r tqr qugf "uj kr r kpi " qhheg"dwkf kpi "y km'eqpukuv'qh''cdqwi'42/hv/j ki j "o cuqpt { "y cmu0'Ki'ku"cpvkekr cvgf "y cv'yj g"uj kr r kpi " qhheg"dwkf kpi "y km'eqpukuv'qh''cdqwi'42/hv/j ki j "o cuqpt { "y cmu0'Ki'ku"cpvkekr cvgf "y cv'yj g"uj kr r kpi " qhheg"dwkf kpi g" 'hmqt"gmxcvkqp"*HHG+0'Cu"y g"r tqlgev'ku"kp"c"r mppkpi "uvci g."f gvkrgf "f tcy kpi u"cpf " uvtwewtcn'cpcn{ uku'tguvnu''ctg"pqv'cxckrcdm?'cv'y g''ko g''qh''r tgr ctcvkqp"qh'y ku'i gqvgej pkecn'tgr qtv0'Vj gtghqtg." y g''cuuvo g''y cv'y g''o czko wo 'y cmhqcf 'y km'pqv'gzeggf '7/nkr lhv'cpf 'y g'o czko wo "eqnwo p'mcf "%h''cp{+'y km'' pqv'gzeggf '82/nkr 0'

Cu'r gt ''y g''kphqto cvkqp''r tqxkf gf ''d { "**Unqcp**''vq'**Ko r gt kcn**''y g''r tqlgev'kpxqnxgu''f gxgmr o gpv''qh''y g''rc { f qy p'' { ctf "eqpukuvkpi ''qh'hxg'*7+''qwf qqt'uvqtci g''ctgcu''y kj ''o gf kwo /f w{ "cur j cnv''qt "eqpetgvg''r cxgo gpu''cpf ''hqwt" *6+''kpvgtpcn''eqppgevkpi ''tqcf u''y kj ''j gcx {/f w{ "eqpetgvg''r cxgo gpu0''Vj g''go r m{ gglxkukqt "ect "r ctmkpi ''nqv'' y kn'dg''r tqxkf gf ''y kj ''cp''cur j cnv''r cxgo gpv0'Vj g''r tqlgev'y kn''cej kgxg''y g''uvqto y cvgt 'kphkntcvkqp'tgs wktgo gpu'' d{ ''dwkf kpi ''y tgg'*5+'uvqto y cvgt''r qpf u''qp'' g''gcuv.''uqwj gcuv/uqwj .''cpf ''y guv'ukf gu'qh'y g''r tqr qugf ''rc {f qy p'' { ctf 0''

Cv'y g"tgs wguv'qh'**Uncp'**'q"eqpf wev'c"i gqvgej plecn'gzr mtcvkqp"qh'y g"ukg"hqt"y g"r tqlgev'f guetkdgf "cdqxg." **Korgt lcni**'r tgr ctgf "c"r tqr qucn'q'f tkm'ucpf ctf 'r gpgvtcvkqp'\guv\#URV+'dqtkpi u'hqt'y g"r tqr qugf 'dwkrf kpi "cpf " r cxgf 'ctgcu.'\q'f tkm'dqtkpi u'hqt'r qpf u'wukpi 'c'j cpf 'cwi gt"*J C+'cmpi 'y kj 'F ktgev'Rwuj 'Vgej pqnqi { "*F RV+." vq" eqmgev' uco r ngu" hqt" ncdqtcvqt { " encukhlecvkqp" yguvkpi cpf " r gto gcdkkw{ " ygukpi ." cpf " vq" r tgr ctg" c" i gqvgej plecn'gpi kpggtkpi "tgr qtv'y kj 'tgeqo o gpf cvkqpu0'**Hi wt g'4'**ku"y g"Ukg"Rncp"uj qy kpi "y g"r tqr qugf " r tqlgev'ukg.'cu'y gmicu'y g'nqecvkqpu'qh'URV"cpf 'J C IF RV'dqtkpi u0"

I gqvgej plechCrrtqcej "

Vj g" qdlgevkxg" qh' qwt " i gqvgej plecn" gzr mtcvkqp" hqt" y g" r tqr qugf " r tqlgev' y cu" vq" qdvckp" kphqto cvkqp" qh' ukg/ur gekhe 'uwduwthceg' eqpf kkqpu. "gxcnwcvg' y g'i gqvgej plecn'uwkxcdkrkv{ "qh' y g'ukg."cpf "o cmg'i gqvgej plecn" gpi kpggtkpi 'tgeqo o gpf cvkqpu'qp' y g'hqmqy kpi 'vqr keu<"

- Á Uqkriutcvki tcrj { "cv'y g"dqtkpi "nqecvkqpu"cpf "cp"crrtqzko cvg"uqkrirtqhkng0"
- •Á I gpgtcn' mecvkqp" cpf "f guetkr vkqp" qh''r qvgpvkcm{ "r tqdngo cvke" o cvgtkcnı." kh'' gpeqwpvgtgf "cv'' vguv'' mecvkqpu. 'y j kej ''o c { 'kpvgthgtg''y kij ''eqpuvt wevkqp''r tqi tguu''qt''pgy ''uvt wewstg''r gthqto cpeg. 'kpenwf kpi '' hkm. ''qti cpkeu. ''eqpuvt wevkqp''f gdtku. ''gve0'
- A K gpvkhecvkqp"qh"uqo g"et kkecn"f guki p"qt"eqpuvt wevkqp"f gvckni. "kpenvf kpi "r t gugpv"i t qwpf y cvgt "vcdrg"
 *1 Y V+"rgxgni. "guvko cvgf "y gv"ugcuqp"I Y V"rgxgni. "cpf "ugcuqpcn"hrvewvcvkqpu"kp"vj g"ur gekhegf "ct gcu0"
- A Gpi kpggtkpi 'tgeqo o gpf cvkqpu'hqt 'y g'r ncego gpv'cpf 'eqo r cevkqp''qh'cr r tqxgf 'hkm'o cvgtkcni'kp''cpf '' ctqvpf 'y g'r tqr qugf 'dvkrf kpi .'r cxgo gpvu ''cpf ''y g''uvqto y cvgt 'tgvgpvkqp'r qpf u0'



 $Vq"qdvckp"'yj",g"pgeguuct { "lphqto cvkqp." Korgt kcn'wugf "cxckrcdrg"t guqwtegu."eqpf wevgf "qp/uksg"cevkxkkgu."cpf" r gthqto gf "rcdqtcvqt { "dcugf "xkuwcn'encuukhecvkqp"cpf "gxcnwcvkqp"cu"pggf gf 0'Vj g"hqmqy kpi "ku"c"uwo o ct { "qh" y g"ueqr g"qh'yj g"y qtm'eqo r ngvgf "cv'y g"ukg0"$

Rwtrqug'cpf 'Ueqrg'qh'Y qtm'

Vj g''r wtr qug''qh''qwt''i gqvgej plecn'gzr mtcvlqp''y cu'vq''qdvclp''y g''lphqto cvlqp''eqpegtplei ''y g''uqkd'eqpf kkqpu'' gzknkpi ''cv'y g''ukg''cpf ''q''gxcnwcyg''y go 'tgncvlxg''q''y gkt'lpvgtcevlqp''y kj ''y g''tqr qugf ''r tqlgev0Vq''ceeqo r nkuj '' y g''chqtguckf ''qdlgevlxgu.''y g''eqo r ngvgf ''qwt''ueqr g''qh'y qtm'y cv'j cu''lpenwf gf ''y g''nqmy kpi <''

- A Eqpf wevgf "c"uvduwthceg" gzr nqtcvkqp" y cv' kpenvf gf "y g"f tknkpi "qh"uvcpf ctf "r gpgvtcvkqp" vguv' *URV+" dqtkpi u<'y tgg'*5+'URV''dqtkpi u'\q'f khgtgpv'\gto kpcvkqp'f gr y u'xct { kpi 'htqo '47'\q'57/hv'hqt''y g'r tqr qugf " uj kr r kpi "qhhkeg"dvknf kpi ."cpf "grgxgp"*33+''URV''dqtkpi u'\q''c"eqpuvcpv'f gr y "qh'32/hv'hqt''y g''r tqr qugf " r cxgo gpv'ctgcu0'
- •Á Kp"cffkkqp. "Korgt kcn"ftkngf "ukz "*8+"dqtkpi u"vq"c"eqpuvcpv"fgr y "qh"34/hv"fgr y "hqt"y g"uvqto y cvgt" r qpf u."y j gtg"j cpf "cwi gt"*J C+"ftknhpi "y cu"eqpf wevgf "kp"y g"wr r gt/| qpg"*cdqxg"I Y V+"cpf "F ktgev" Rwuj "Vgej pqmj { "*F RV+"wukpi "c"ftknhpi "tki "y cu"cr r nkgf "vq"cf xcpeg"y g"dqtkpi u"kp"y g"my gt/| qpg0"
- •Á Qwt '\guv\pi '\penvf gf '\j g'h\gnf 'cpcn{ uku'qh'uqkt\uco r gu'eqnge\gf 'cpf '\j g'tgeqtf kpi 'qh'URV'dqty 'eqwpu'' f wt\pi "\j g"f tkm\pi "qh"URV''dqt\pi u0'Vj g"URV''dqt\pi u"y gtg"eqpf we\gf "\pi i gpgtcn'ceeqtf cpeg"y kj " CUVO 'F 37: 8''y kj ''\j g''ckf ''qh''c''f tkm\pi ''tki 0'Vj g''cr r tqzko c\gruec\\qpu''qh''cm'dqt\pi u''ctg"uj qy p"\pi'' Hki wt g'40'Vj g''dqt\pi ''nqi u''ctg'\penvf gf '\po'Cr r gpf kz 'C0''
- A Cv' ý g"URV" dqtkpi "mqecvkqpu."c"j cpf "cwi gt" y cu"ectghwm{ "wugf "kp" ý g" wr r gt "6/hv"f gr ý "vq" cxqkf " wpkpvgpf gf "uvtknkpi "qh"cp{ "gzkuvkpi "wktkkgu"qt "wpf gti tqwpf "qduvt wevkqpu" ý cv'tgo ckpgf "wpf gvgevgf 0' Tqvct{ "ftkmkpi "cpf "URV" vgej pks wgu' y gtg" wugf "dgnqy "6/hv"f gr ý 'vq" tgeqtf "ý g"dnqy "eqwpvu" P / xcnwgu+0'
- •ÁO gcuwtgf "ý g"f gr ý u"vq"i tqwpf y cvgt" vcdrg" *I Y V+"cv" ý g" dqtkpi "rqecvkqpu" *y j gtgxgt "I Y V" y cu" gpeqwpvgtgf +0O gcuwtgf 'ý g'f gr ý u'vq'ugcuqpcn'j ki j /y cvgt 'o ctm'*U Y O +'cv'ugrgevgf 'dqtkpi 'rqecvkqpu0' Vj g'I Y V'cpf 'U Y O 'f gr ý u'y gtg'tgeqtf gf 'f wtkpi 'ý g'f tkmkpi ''qr gtcvkqpu0''
- A Eqngevgf 'hqwt'*6+'Uj gml{ "Vwdg'*UV+'uco r mgu. 'w q'*4+'j qtk qpvcn'cpf 'w q'*4+'xgtvkecn'kp''y g'r tqr qugf " uvqto y cvgt'r qpf 'ctgcu.'cpf 'eqpf wevgf 'ncdqtcvqt { 'eqpuvcpvj gcf 'r gto gcdktks{ 'vguvu0''
- •Á Xkuwcm{ "encuukhlef "yj g"uco r ngu"lp"ncdqtcvqt { "wukpi "Wplkhlef "Uqkn'Encuukhlecvkqp"U{ uvgo "*WUE U+'r gt'' CUVO 'Uvcpf ctf 'Rt qegf wt g'F 46:: 0F gxgqr gf ''y g'' gpgtcn'uqkn'uvtcvki tcr j { 'hqt"dqtlpi ''nqecvkqpu0'
- A T gxkgy gf "cxckrcdrg"kphqto cvkqp"qp"yj g"ukg. "kpenwf kpi "yj g"Wpkgf "Ucvgu"F gr ctvo gpv"qh"Ci tkewnwtg" *WUF C+"P cvkqpcn"T guqwteg"Eqpugtxcvkqp"Ugtxkeg"*P TEU+"Uqkh"Uwtxg{ "T gr qtv."qdvckpgf "ur gekhke"vq" yj g"r tqlgev'ukg0Vj g"WUF C/P TEU'Uqkh"Uwtxg{ "T gr qtv'ku"kpenwf gf "kp"Cr r gpf kz 'D0"
- A Rgthqto gf "i gqvgej pkecn'gpi kpggtkpi "cpcn{ugu"vq"f gxgrqr "i gqvgej pkecn'gpi kpggtkpi "tgeqo o gpf cvkqpu"
 - hqt "gcej "qh'yj g'r tqr qugf "r tqlgev'eqo r qpgpvu"cu'r tgxkqwun{ "f kuewuugf 0"
- A Rtgr ctgf " y ku" i gqvgej pkech' tgr qt v' d { "uvo o ctk kpi " qvt" hkgnf " cpf " mdqtcvqt { " f cvc" i gpgtcvgf ." qvt" vpf gtuvcpf kpi "qh' y g''uvduwthceg" uqkd'cpf "i tqvpf y cvgt " vcdrg" *1 Y V+"eqpf kkqpu" cv' y g''ukg." cpf " qvt" i gqvgej pkech'gpi kpggtkpi 'tgeqo o gpf cvkqpu'hqt " y g'' tqr qugf 'r tqlgev0'



UqkriUwt xg{ "T gxkgy "

Vq"qdvckp"c"dgwgt"wpf gtuvcpf kpi "qh'y g"uwduwthceg"eqpf kkqpu"cv'y g"r tqlgev'ukg."**Korgt kcn**'tgxkgy gf "y g" tgcf kn{"cxckrcdrg"r wdrkuj gf "kphqto cvkqp"cdqwi'y g"ukg."kpenwf kpi "y g"qprkpg"kphqto cvkqp"r tqxkf gf "d{"y g" Wpkgf "Ucvgu"F gr ctvo gpv'qh'Cit tkewnwtg'*WUF C+'P cvkqpcn'Tguqwteg"Eqpugtxcvkqp"Ugtxkeg"*P TEU+0"Vj g" WUF C/P TEU"Uqkn'Uwtxg{"Tgr qtv'*kpenwf gf "cu" **Cr r gpf kz 'D**+''y g"i gpgtcvgf "qprkpg"ur gekhecm{"hqt "y g" r tqlgev'ukg'kpf kecvgu'y cv'y g''r tqlgev'ukg'ku'wpf gtrckp'd{"w q'*4+'npqy p'o clqt'uj cmy "uqkriv{r gu<"

- A Dcukpi gt 'hpg'ucpf.'2'\q'4'r gt egpvluqr gu'%/4+'6'Eqxgtu'cdqwv82'r gt egpv'qh'y g'uky. 'o qunf 'hp'y g''egpvt ch' cpf "uqwy gt p"rqt kqpu0'Rct gpv'o cvgt kcnu''ct g"ucpf {"o ct kpg"f gr quku0'Eqpukuu"qh''hpg"ucpf "ht qo "y g" i tqwpf 'lunt hceg'\q': 2/kpej 'f gr y ''dgnqy ''y g'' i tqwpf 'lunt hceg0'Guko cvgf 'f gr y ''q''y g'' i tqwpf y cvgt ''cdng"
 Y V+ku''cdqwv'2'\q'34/kpej ''dgnqy ''y g'' i tqwpf ''unt hceg0Vj g'WUF C'F tckpci g'Encuu'ku'ör qqt n('f tckpgf ö0'' "
- Á Rkpgf c/Rkpgf c. 'y gv. 'Hpg''ucpf. '2''q''4''r gtegpv'unqr gu''% +'6'Eqxgtu''cdqwv'62''r gtegpv'qh'y g''ukg. 'o qum(" kp''y g''pqty gtp''r qtvkqp0Rctgpv'o cvgtkcnu''ctg''ucpf { "cpf ''nqco { 'o ctkpg'f grqukuu0Eqpukuu''qh'Hpg''ucpf " htqo ''y g'' tqwpf ''ngxgn''q'58/kpej 'f grvj. ''Hpg''ucpf { ''nqco ''t qo '58''\q'76/kpej 'f grvj u ''cpf ''Hpg''ucpf ''t qo '' 76'\q': 2/kpej 'f grvj u0Guako cvgf 'f grvj ''q''y g'' tqwpf y cvgt '\cdng'* Y V+ku''cdqwv'8'\q''3: /kpej ''dgnqy ''y g'' i tqwpf 'luwthceg0Vj g'WUF C'Ftckpci g'Encuu'ku'ör qqtn('f tckpgf ö0''

Vj g"Uqkrl'Uvtxg{"Tgr qtv'kpf kecvgu"yj cv'o quv'qh'yj g"r tqlgev'ukg"ku'wpf gtnckp"d{"ucpf {"uqkrl"yj qwi j "j ki j gt" ukrvlenc {"eqpvgpv"uj qwrf "dg" cpvkekr cvgf "kp" yj g"pqtyj gtp"r qtvkqp0'Dqyj "uqkrl"v{r gu"ctg" guvko cvgf "vq" j cxg" tgncvkxgn{"xgt {"uj cmqy "I Y V"cpf "r quuguu"r qqt "f tckpci g"ecr cekx{0'Vj g"uj cmqy "I Y V"cpf "r qqt"f tckpkpi " uqknl'eqwrf 'j cxg"uqo g'ko r cev'qp'yj g'eqpuvt wevkqp"cpf 'hwwtg'r gthqto cpeg'qh'yj g'' tqlgev.'wpnguu'uwej 'ko r cevu" y qwrf "dg"o kki cvgf "d{"o ckpvckpkpi "yj g"tgeqo o gpf gf "xgtvkecn'ugr ctcvkqpu'vq"yj g"ugcuqpcn'j ki j "I Y V."cu" tgeqo o gpf gf 'hwtyj gt'kp"yj ku'tgr qtv0"

...

HKGNF 'GZRNQTCVKQP 'CPF 'NCDQTCVQT['VGUVKPI 'RTQI TCO ''

I gqvgej plechHgrf 'Gzrnqtcvkqp'Rtqitco''

Vj g"hkgrf "gzr nqtcvkqp"rtqi tco "y cu"r gthqto gf "wpf gt" y g"i gpgtcn'f ktgevkqp"qh" Korgt kmu" Rtqhguukqpcn' I gqvgej pkecn' Gpi kpggt0' Vj g"rtqegf wtgu" Korgt kch' wugf "hqt"hkgrf "ucornkpi "cpf" vgukpi "ctg" kp"i gpgtcn' ceeqtf cpeg"y kj "kpf wuxt {"ucpf ctf u"qh'ectg"cpf "guvcdrkuj gf "i gqvgej pkecn'gpi kpggtkpi "rtcevkegu0' Korgt kch' ftkmgf "y g"uqkn'dqtkpi u"qp"Cwi wuv'4: "cpf "4; ."4245."wukpi "Korgt kcmu" vtcem/o qwpvgf "I gqrtqdgì "ftkmkpi " tki u "j cpf "cwi gt."cpf "F ktgev'Rwuj "Vgej pqmi { "*F RV+'tki 0'Crrtqzko cvg'mecvkqpu"qh'y g"dqtkpi u"ctg"uj qy p" qp"y g"cwcej gf "Ukg'Rmcp'**Hki wt g'4**0"

Vj g"uqkıl'dqtkpi u'y gtg"f guki pcvgf "cu'**URV/3**'y tqwi j "**URV/5**."cu'**TD/3**'y tqwi j "**TD/33**."cpf "cu'**RD/3**"y tqwi j " **RD/8**0'Vj g"URV"dqtkpi u''y gtg"eqo r mygf "kp"i gpgtcn'ceeqtf cpeg"y kj "C**UVO 'F 37: 8**"wukpi "vtcenn'o qwpvgf " I gqr tqdgl "f tkmlpi " tki " y cv' ku" hwvgf " y kj " c" uvcpf ctf " cwqo cvke/j co o gt0' Vj g" uqkni" y gtg" uco r ngf" eqpvkpwqwun{ ''q''32/hv'f gr y ."cpf "cv'7/hv'kpgtxcni'y gtgchgt."vq"y g"dqtkpi "yto kpcvkqp"f gr y 0'Vj g"uco r ngu" y gtg"r megf "kp"ugcngf "r muvke"dci u''q'tgvckp"o qkuwtg"kp"y g"hgnf "cpf "y gtg"tgwtpgf "vq"qwt "mdqtcvqt{ "hq" hwty gt "gxcnxcvkqp" cpf " xkuwcn' emuukhkecvkqp"d{ " c" r tqlgev'r tqhguukqpcn' vq" xgtkh{ " y g" f tkmgtøu" hkgnf " uqki" emuukhkecvkqp0Vj g'URV'P/xcmwgu'tgr qtvgf 'cv'xctkqwu'f gr y 'kpvgtxcmi'qp'y g'dqtkpi ''nqi u'tgr tgugpv'y g"pwo dgt" qh'uchgv{/j co o gt/gs wkxcmgpv'dmy u"*362/m"j co o gt"hcmkpi "52/kpej +'tgs wktgf "'q"cf xcpeg''c"4/kpej "'ur nkv' ur qqp''uco r ngt ''y tqwi j "c"f gr y "qh'3/hv'kpvq"y g"uqkn'cv'y g"dqwqo "qh'dqtkpi 0'F gvckrgf "mi u"qh''URV''dqtkpi u" ctg"r tqxkf gf "kp''Cr**r gpf kz'C**0'

..



Ammunia group proceep proceep

Rqpf "dqtkpi u"y gtg"cf xcpegf "wukpi "c"5/kpej "j cpf "cwi gt"*J C+"cpf "y kj "c"f tknkpi "tki "wukpi "F ktgev'Rwuj " Vgej pqrqi {" *F RV+0' Vj g" dqtkpi u" y gtg" eqpf wevgf " kp" ceeqtf cpeg" y kj " y g" ucpf ctf " o gy qf " qh" Uqkn" Koxguski cvkqp"cpf "Ucornkpi "d{ 'Cwigt "Dqt kpi u."cu'hqwpf "kp"CUVO 'F 3674"qt 'F ktgev'Rwuj "Uqkt Ucornkpi "cu" hqwpf 'hp'CUVO 'F 84: 40F ktgev'r wuj 'cf xcpego gpv'ku'eqpf wevgf 'y kyj 'c'xkdtcvkpi 'f tkxg'j co o gt 'yj cv'r wuj gu' c'307/kpej 'KF 'uvggnluco r ngt 'y cv'ku'hkpgf 'y kj 'r ncuvke0Qpeg'r wuj gf 'vq'y g'f gukt gf 'f gr y . 'y g'r ncuvke'hkpgt 'y kj " y g'uqkriuco r mg'ku'gz v cevgf "ht qo 'y g'uco r mgt0Vj g'r ncuvke "rkpgt 'ku'y gp'ewi'npi kwf kpcm('y gtgd { "gzr qukpi " y g"eqmgevgf "uqkn"eqnvo p0'Xkuvcn'Encuukhecvkqpu"qh"cm"uqkn"uco r mgu"ecp"dg"hqwpf "qp"y g"f gvckrgf "rqi u" r tqxkf gf 'kp'Crrgpf kz'C0'

Uj gnd{ 'Vwdgu'*UV+'hqt 'Ncdqt c vqt { 'Rgt o gcdktw{ 'Vguvkpi ''

Korgt kenleqngevgf "hqwt"*6+'UVu. "nedgngf "eu'RJ /3'epf "RX/3."epf "eu'RJ /4"epf "RX/4."d{ "gzecxevkpi "uj emqy " r ku'\q'52/kpej 'f gr y 'bgct'y g'bqt y gcuvgtp'gpf 'qh'r tqr qugf 'r qpf '422'cpf '\q'58/kpej 'f gr y 'bgct'y g'uqwj gtp'' gpf " qh" r qpf " 322." tgur gevksgn{0' Ko r gt kcmu" i gqvgej pkecn' rcdqtcvqt{" eqpf wevgf " y g" eqpuvcp \sqrt{j} gcf" r gto gcdktkv{ "vguvu"qp"vj g"UVu"vq"f gvgto kpg"vj g"eqpuvcpv/tcvg"cv'y j kej "vj g"uqktu"ecp"cmqy "kphktutcvkqp0'Vj g" r gto gcdktkv{" vguvu" y gtg" eqpf wevgf " r gt" CUVO "Uvcpf ctf "Vguv' O gvj qf "F4656" *y kj " cr r necdrg" o qf khecvkqpu+."d{"o ckpvckpkpi 'c"eqpuvcpv'y cvgt'j gcf 'qh'cdqw/52/kpej 'cpf 'tgeqtf kpi ''y g''ko g''cngp''q''cnqy " hqt'o gcuwtgf 'xqnvo g'qh'y cvgt'uggr ci g0Hkxg'uwej 'tgcf kpi u'y gtg'\cngp'\q'qdugtxg''y g'uvgcf kpguu'qh'hqy "cpf" vq'qdvckp''cxgtci g'r gto gcdktk{ 'xcnxgu0Cu'r gt 'CUVO 'F 4656. 'y g'hqmqy kpi ''gs wcxkqp'y cu'wugf ''yq'f gygto kpg'' y g'eqghhekgpv'qh'r gto gcdkrkv{0"

Rgto gcdkrkv{."m*eo lu+<" "

Rgto gcdkrkv{	. m eo I	u+< "	$\mathbf{k} = -\frac{QL}{Ath}$
	yjg	tg<" "	S "? "xqnwo g"qh'hrqy ."eo ⁵ "
	"	"	N"? "ngpi yi "qh"uqkn"uco r ng"\guvgf. "eo "
	"	"	C"? "etquu"ugevkqpcn"ctgc"qh'uqkn'uco r ng. "eo 4""
	"	"	v'? 'Vko g''qh'hqy .''u''
			i "? "eqpuvery'i gef "o geuwtgf, "eo "

Crrn(kpi "yj g"cdqxg"gs wcvkqp"y kj "eqttgevkqpu"hqt"xkuequkv{"qh"y cvgt"wugf "cpf "hqt"xctkcvkqpu"kp"uco rng" eqmgevkqp"cpf "vguvkpi "eqpf kkqpu." Korgt kchlguvko cvgu" vj g"cxgtci g"r gto gcdkrkv{ "xcnvgu"cu"hqmqy u<"

Vguv' P q0'	Ucorng" Fgryj" *kpej+"	Ucorng" Fktgevkqp"	Ucorng'Fguetkrvkqp"	Cxgtcig" Rgtogcdkrkv{" *m+."hv/fc{"
RJ /3"	52"	J qtk qpvcn	Vcp. "nki j v'vcp. "cpf "qtcpi kuj "vcp" unki j vn{ "uknv{ "hkpg" ucpf "	504"
RX/3'"	52"	Xgtvkecn'	Vcp"cpf "hi j v'vcp"o kzgf 'unki j vn{ 'uknv{ 'hkpg"ucpf "	; 04"
RJ /4'"	58"	J qtk qpvcn'	Dtqypkuj'itc{''uknv{''hkpg''ucpf''vq''c''hkijv'itc{''unkijvn{'' uknv{''hkpg''ucpf''	205"
RX/4'"	58"	Xgt vkecn'	Dtqypkuj'itc{''uknv{''hkpg''ucpf''	205"

Vj gug"r gto gcdktkv{ "xcnvgu"ctg"wphcevqtgf "cpf "uj qwrf "dg"vcngp"cu"uvej "f wtkpi "vj g"f guki p"qh"uvqto y cvgt" r qpf u'r tqr qugf "cv'y ku'r tqlgev'uksg0**Korgt kcni**tgeqo ogpf u'y cv'y g'f guki p"qh'y g'uvqto y cvgt"r qpf u'u qwrf " eqpukf gt 'ý gug't gto gcdktk{ 'xcnvgu'qi gy gt 'y ký 'ý g'f cvc't tgugpvgf 'kp'ý g'hqi u'qh't qpf 'dqtkpi u'**RD/3**'ý tqwi j " RD/80¹Vj gug"r gto gcdktw{ "tguwuwu"cpf "f gvckuu"qh"r qpf "dqtkpi u"RD/3"vj tqwi j "RD/8'y km'dg"f kuewuugf "kp"c" ncwgt "ugevlqp" qh'y ku't gr qt v'cmpi "y kj "qwt"t geqo o gpf cvlqpu'hqt "y g"uvqto y cvgt "r qpf u"r t qr qugf "cv'y ku'ukg0"



Ncdqtcvqt{'Vguvlpi'Rtqitco''

Xkuwcn'ercuukhecvkqp"y cu"r gthqto gf "cu"r gt "y g"Wpkhgf "Uqkti'Ercuukhecvkqp"U{uvgo "*WUEU+"r tqegf wtgu" qwrkpgf "kp"Crrgpf kz'E'*CUVO 'F46::+0Ncdqtcvqt {"vguvu"ctg"i gpgtcm{"r gthqto gf "vq"cuukuv'kp"y g"uqkti ercuukhecvkqp"dcugf "qp"y gkt "o gej cpkecn'cpf "r j {ukecn'dgj cxkqt0Dgecwug"qh'y g"r tgf qo kpcpvn{"ucpf {"uqku" gpeqwpvgtgf 'kp"cm'y g'uqkti'dqtkpi u."pq"rcdqtcvqt {"ercuukhecvkqp"vguvu'y gtg'tgs wtgf0Cu"pqvgf "cdqxg."tguvnu" qh'xkuwcn'gzco kpcvkqp"qh"cm'uco r mu."ctg"kpenwf gf "qp'y g"dqtkpi "mi u'kpenwf gf 'kp"Crrgpf kz'C0"

Uco rng'Tgvckpci g''''

Uco r ngu"qdvckpgf "htqo "vj g"hkgnf "gzr nqtcvkqp"r tqi tco "j cxg"dggp"uvqtgf "cv" **Ko r gt ken**u"ncdqtcvqt {0'Vj gug" uco r ngu"y kn'dg"tgvckpgf "hqt"c"r gtkqf "qh'82"f c{u"htqo "vj g"f cvg"qh"tgngcug"qh"vj ku"tgr qtv'cpf "f kuectf gf." vj gtgchvgt. "vpnguu"tgs vguvgf "kp"y tkkpi "htqo "vj g"enkgpv0"

UWDUWTHCEG'UQKN'CPF'I TQWPFY CVGT'VCDNG'*I Y V+'EQPFK/KQPU'

Uwduwt hceg'UqkriEqpf kskqpu''

Dqtlpi u'**URV/3**'ý tqwi j '**URV/5'**'y gtg'f tkngf 'kp'ý g'ctgc'qh'ý g'r tqr qugf ''uj kr r kpi ''qhhkeg'dwkrf kpi ''q'f khgtgpv' vgto kpcvkqp'f gr ý u'xct{kpi 'htqo ''47''vq''57/h0'Vj g'r cxgo gpv'dqtkpi u.'**TD/3**''ý tqwi j '**TD/33.**''y gtg'f tkngf ''q' c"eqpuvcpv'vgto kpcvkqp''f gr ý ''qh''32/hv''kp'' ý g''r tqr qugf ''r cxgo gpv''ctgcu''eqxgtkpi ''ý g''go r m{ggkxuksqt"ect" r ctnkpi ''mv' pgct'' ý g''r tqr qugf ''uj kr r kpi ''qhkeg''dwkrf kpi .''r tqr qugf ''qwf qqt''uvqtci g''ctgcu.''cpf ''kpygtpcn'' eqppgevkpi ''tqcf u'kp''ý g''r {f qy p''{ctf 0'Vj g''r qpf ''dqtkpi u''**RD/3**''ý tqwi j ''**RD/8**''y gtg''f tkngf ''vq'' ý g''uco g'' vgto kpcvkqp'f gr ý ''qh'34/hv'kp''ý g''ctgcu''r tqr qugf ''hqt''uvqto y cvgt''r qpf u''322.''422.''cpf ''5220'

Uqkıl'r tqhkıgu''qdvckpgf "htqo " y g''cdqxguckf "dqtkpi u''tgxgcn' y g''r tgf qo kpcpv''gzkurgpeg''qh''r qqtn{/i tcf gf " urki j vn{"ukuv{ 'vq"em {g{ "hkpg"ucpf u'*URIUO . "UO ."UO 1UE."UE+'wr "vq"y g''o czko wo "gzr mtgf "f gr y "qh'57/hv0' Tqenicpf "u gmlo cvgtkcmi'y gtg"gpeqwpygtgf 'pgct'y g''uwthceg'cu'y g''ukg'ku'dgkpi "ewttgpvn{"wktk} gf 'cu'wpr cxgf " r ctmkpi luvqtci g''ctgc0'V j g''uqr/| qpg"uqku''ctg''r qqtn{/i tcf gf "urki j vn{"ukuv{ "hkpg"ucpf u'*URIUO + "gzegr v'hqt"c" hgy 'nc { gtu'qh'r qqtn{/i tcf gf 'ukuv{ "hkpg'ucpf u'*UO +0Nc { gtu'qt 'hgpugu'qh'r qqtn{/i tcf gf 'em { g{ 'hkpg'ucpf u'*UE+'' y gtg''qpn{"gpeqwpygtgf 'kp'y g'kpygto gf kcvg''cpf ''ny gt/| qpgu'qh'uqo g''dqtkpi u0Uqku'kp'y g''vr r gt/| qpg''wr 'vq" : 2/kpej "f gr y +''ctg''o quvn{ "eqpukuvgpv'y kj "y g''WUF C/P TEU'Uqkt'Uvtxg{ 'T gr qtv'r tgf kevkqpu''hqt "*Dcukpi gt'' Hpg'ucpf u'*Cpf '*Rkpgf c/Rkpgf c 'lkpg'ucpf u*0Kp'cp{ 'qh'y g''guv'dqtkpi u 'Ko **r gt kcti** fk ''pqv'gpeqwpygt ''cp{ ''wpuvcdmg'' uqku.'uwej ''cu'qti cpkeu'qt'f gdtku.''j cv'eqwf ''pgi cvkxgn{ ''b r cev'y g''r tqr qugf ''eqputwevkqp0''

URV'P /xcnwgu''ctg''pqv''cxckrcdrg''htqo ''gzkuklpi ''i tcf gu''q''6/hv'f gr yj ''kp''yj g''dwkrf kpi ''dqtkpi u''**URV/3'**'yj tqwi j '' URV/5.''cpf ''r cxgo gpv''dqtkpi u''TD/3''yj tqwi j ''TD/33.''cu'j cpf ''cwi gt''f tkrkpi ''y cu''eqpf wevgf ''q''cxqkf 'j kwkpi '' cp{ ''wpf gvgevgf ''wkrkkguO'Cu''uqo g''r qtvkqpu''qh''yj g''ukg''ctg''r tqxkf gf ''y kj ''c''uwthkekcn'rc {gt''qh''tqemluj gm''q'' uwr r qtv''yj gkt ''ewttgpv''wug'''hqt''r ctrikpi luvqtci g.''uwej ''uqku''o kzgf ''y kj ''tqemluj gm''qhligtgf ''j kj j ''tgukurcpeg''q'' j cpf ''cwi gt'f tkrikpi 0Wpf gtn{ kpi ''uqku'y kj 'pq tqemluj gmlo quvn{ ''qhligtgf ''o kpko critigukurcpeg''q'' yj g'' cpf ''cwi gt'' f tkrikpi 0'Vj gtghqtg.''y g''eqpukl gt''y cv''yj g''r qqtn{ /i tcf gf ''hkpg''ucpf u''*URIUO ''qt''UO +''gpeqwpvgtgf ''kp''y g'' uj crnqy '' qpg''htqo ''dqwqo ''qh'tqemluj gm'\q'6/hv'f gr yj ''ctg'o quvn{ 'kp''c'*nqqug*''eqpf kkqp0Vj ku'i gpgtcn'tgpf ''y cu'' pqvgf ''kp''crn'uqki'dqtkpi u''cv'yj g''ukg0'Chgt''tgo qxcn'qh''gzkurkpi ''tqemluj gm'*uksg''uvtkr r kpi +''yj g''qr /| qpg''uqku'' uj qwrf ''dg''eqo r cevgf ''d{ ''r tqqh/tqmkpi ''qh'yj g'' r tqr qugf ''dwkrf kpi ''cpf ''r cxgo gpv'ctgcu0'

Kp ''y g''dqtkpi u'**URV/3''**y tqwi j **'URV/5'**f tkngf ''kp ''y g''ctgc''r tqr qugf ''hqt''y g''u kr r kpi ''qhheg''dwkrf kpi .''y g''URV'' $P/xcnwgu''tgeqtf gf ''kp ''uqkri're {gtu''htqo ''6/hv''vq''y g''o czko wo ''dqtkpi ''vgto kpcvkqp''f gr y ''qh''57/hv.''y gtg''kp''y g''' tcpi g''qh''6''vq''42.''kpf kecvkpi ''y g'' gggtcri'r tgugpeg''qh'$ *nqqug''vq''o gf kwo ''f gpug''* $uqkri're {gtu0'''$



Vjg''cdqxgogpvkqpgf 'fgpukv{ 'eqpfkvkqpu'qh'uqku'ctg''dcugf ''qp''yg''WUEU'eqttgrcvkqpu'ykj''URV''drqy ''eqwpu'' *P/xcnwgu+0Yg''kpenvfgf''c'WUEU'UqkriTgrcvkxg'Eqpukuvgpe{ 'Ejctv'kp''C**rrgpfkz'E** 'hqt''{qwt'tgcf{ 'tgbgtgpeg0'''''

 $\label{eq:V} Vjg''URV'P/xcnwgu'tgeqtfgf''kp'c'xcgogpv'dqtkpiu'TD/3''ytqwij''TD/33''ykn'dg'fguetkdgf''kp''c''ncwgt''ugevkqp'''qh''yku'tgrqtv'qp''Rcxgogpv'Tgeqoogpfcvkqpu''$

I tqwpf y cvgt 'Vcdrg'*I Y V+'Eqpf kkqpu'''

F wtkpi 'ý g'f tkmkpi 'r j cug'qh'qwt'hkgrf y qtm **'Ko r gt kcm**u'ýgco 'gpeqwpygtgf 'ý g'I Y V'kp'ý g'dqtkpi u'cvf khgtgpv' f gr ý u'xct { kpi 'htqo ''504''vq'705/hv'dgnqy ''ý g''gzknkpi ''i tcf gu0'D { "f tkmkpi ''y kj ''c''j cpf ''cwi gt ''kp''uo cm'f gr ý '' kpetgo gpwl'y j krg''qdugtxkpi ''ý g''ej cpi gu'kp''uqkrleqnqtcvkqpu. **'Ko r gt kcm**u'hgrf ''etgy ''kf gpvkhgf ''ugcuqpcn'j ki j / y cvgto ctmu''*UJ Y O u+''kp''y g''r qpf ''dqtkpi u''**RD/3'** 'y tqwi j ''**RD/8**. ''cu''y gm''cu''kp''r cxgo gpv''dqtkpi ''**TD/8**. ''cv'' f gr ý u'tcpi kpi ''htqo ''39/kpej '*306/hv+'\q''57/kpej ''*40/hv+''dgnqy ''y g''gzknkpi ''i tcf gu0''

Wukpi "ý g"cr r tqzko cwg"grgxcvkqpu"qdvckpgf "htqo "ý g"vqr qi tcr j {"o cr " r tqxkf gf "d{"**Unqcp**."y g"guvko cvgf "ý g" grgxcvkqpu"qh"ý g"UJ Y O u"vq"dg"cv"cdqw!- 39"vq"- 3: /hv"P CXF::."cv"cdqw!'307"vq"5/hv"f gr ý u"dgrqy "ý g" gzkuvkpi "i tcf gu0'Vj g"ukg"ku"cv"c"tgrcvkxgn{"rqy "grgxcvkqp"y kj" no ksgf "f tckpci g"f wg"vq"rqy "r gto gcdktk{" uvduvthceg"uqkru"{kgrf kpi "r qqt "f tckpci g"ecr ceks{0'Qwt"f cvc"eqphkto u"ý g"ukg"eqpvckpu"c"tgrcvkxgn{"uj crrqy " I Y V."uqo gy j cv'eqpukuvgpv'y kj "ý g"r vdrkuj gf "WUF C"f cvc"hqt"*Dcukpi gt "kpg"ucpf u*'cpf "*Rkpgf c/Rkpgf c"y gv"*

Qwt"cpcn{uku"qh'yj g"cxckrcdrg"f cvc"uwi i guvu'yj g"UJ Y V"ku"cv'f khłgt gpv'f gr yj u'tcpi kpi "htqo "cdqw/307"vq"5/hv" kp"f khłgt gpv'r qt vkqpu"qh'yj g"ukvg0'Vj g"ekx kri'gpi kpggt "y kni'pggf "vq"eqpukf gt "yj g"tgrcvkxgn{"uj cmqy "UJ Y V"cpf" tckug"yj g"gz kurkpi "i tcf gu."cu"pgeguuct {0'Vj gtg"uj qwf "dg"c"o kpko wo "ugr ctcvkqp"qh'3/hv'dgwy ggp"yj g"dqwqo " qh"cp{"hqwpf cvkqpu"cpf "yj g"UJ Y V0'C "o kpko wo "xgt vkecn'ugr ctcvkqp"qh'4/hv'uj qwf "dg"o ckpvckpgf "dgwy ggp" y g"dqwqo "qh'yj g"hrqqt"urcd"cpf "yj g"UJ Y V0'

Vj g'I Y V''grgxcvkqp''ecp''cpf ''o c{ ''hwewcvg''y kj ''ej cpi gu''ecwugf ''d{ ''pcwtcm{ ''qeewttkpi ''eqpf kkqpu'*'uwej ''cu'' ugcuqpcrl'erko cvke''ej cpi gu.'tckphcm'xctkcvkqpu.''uwthceg'twp/qhh+''qt''qy gt''ukg/ur gekhke''o cpo cf g'hcevqtu'''uwej '' cu''eqputvevkqp''cpf ''f gxgmr o gpv''cevkxkkgu''kp''y g''xkekpkv{+0'C''uj cmqy gt'I Y V''ecp''dg''gzr gevgf ''hmqy kpi '' r gtkqf u''qh''j gcx{ ''r tgekr kcvkqp''qt''hmqf kpi 0'Vj gtghqtg.''y g''tgeqo o gpf ''y g''eqpvtcevqt''o gcuwtgu''y g'' Y V'' ngxgn'dghqtg''uvctvkpi ''cp{ ''cevkxk{ ''cv'y ku''ukg0'

"

GXCNWCVKQPU'EQPENWUKQPU'CPF'TGEQOOGPFCVKQPU'

Vj g"qdugtxcvkqpu."gxcnxcvkqpu."cpf "eqpenxukqpu"hqt"vj g"r tqlgev"ukg"qwrkpgf "kp"vj ku"ugevkqp"j cxg"dggp" r tgr ctgf "kp"ceeqtf cpeg" y kj " y g" i gpgtcm{ "ceegr vgf "i gqvgej pkecn' gpi kpggtkpi "r tqegf wtgu"qh"r tcevkeg0' Rgthqto cpeg"qh"cp{ "i gqvgej pkecn'gpi kpggtkpi 'uwrf { 'ku'uvdlgev'vq"o cp{ "rko kcvkqpu'kpj gtgpv"kp"vj g"r tcevkeg" qh" y ku"r tqhguukqp0'Vj gug"rko kcvkqpu"ctg"f kuewuugf "cv" y g"gpf "qh" y ku"tgr qtv"cpf "uj qwrf "dg" ur gekhkecm{ " cr r tckugf "kp"gxcnwcvkpi "y gug"qdugtxcvkqpu."eqo o gpvu."cpf "eqpenxukqpu0'Vj g"rtqr qugf "eqpuvt wevkqp."" cpf "gzr gtkgpeg"y kj 'uko krct'r tqlgewi'cpf 'uvduwthceg"eqpf kkqpu0Vj g'f kueqxgt { 'qh'cp { 'uvduwthceg'eqpf kkqpu" f wtkpi "eqpuvt wevkqp"y j kej 'f gxkcvg'htqo 'vj qug"gpeqwpvgtgf 'kp'vj g"dqtkpi u'uj qwrf 'dg"dtqwi j v'vq'qwt 'cvgpvkqp" ko o gf kcvgn{ 'hqt"qdugtxcvkqp. "gxcnwcvkqp."cpf 'tgeqo o gpf cvkqpu0'

- ..
- ..

Hqwpf cvkqp'Cpcr(uku'cpf 'Ugwrgo gpv'Eqpulf gt cvkqpu''

Vj g"uqku"gpeqwpwgtgf "kp"qwt"dqtkpi u"*dgmy "vj g"tqemluj gm"rc { gt "gzkuklpi "cv"uqo g"mecvlqpu+"cr r gct "vq"dg" pcwtcn"f gr quku"qh"r qqtn{/i tcf gf "urki j vn{"uknv{"vq"enc{g{"hkpg"ucpf u"*URIUO."UO ."UO IUE."UE+."wr "vq"yj g" o czko wo "dqtkpi "vgto kpcvlqp"f gr vj "qh"57/hv0'Uqkt"rc{gtu"kp"yj g"tgrgxcpv"mcf kpi /kphnvgpeg/| qpg"qh" vj g" r tqr qugf "uj kr r kpi "qhhkeg"dwktf kpi "ctg"kp"c"*mqug*"vq"*o gf kwo "f gpug*"eqpf kklqp"*o kpko cn"tgukuvcpeg"vq"j cpf / cwi gtkpi "cpf "vj g"URV"P/xcmvgu"tcpi kpi "htqo "6"vq"42+0"Vj gtghtg."vj g"ukvg"ku"i gpgtcm{"uvkxcdmg"hqt"y g" r tqr qugf "tqlgev"cu"f guetklgf "kp"vj ku"tgr qtv."uvklgev"vq"y g"cpcn{uku"cpf "tgeqo o gpf cvkqpu"f kuewugf "dgmy 0"" "

Rtqr gt "ukg"r tgr ctcvkqp"*uxtr r kpi "cpf "tgo qxcn'qh'tqemluj gm"r tqqh/tqmkpi ."dcemhknkpi ."cpf "eqo r cevkqp+" y kj "s vcnk{ "eqpvtqn'cpf "hqwpf cvkqp"f guki p."cu"qwnkpgf "kp"yj g"hqmqy kpi "r ctci tcr j u."ecp"qxgteqo g"cp{" r qvgpvkcn'kuwgu'y kj "yj g"*nqqug*"uqkn"gzknkpi "kp"yj g"r tqr qugf "eqputvevkqp"ctgcu"cv'yj g"ukg0'Vq"cej kgxg"yj g" f guktgf "HHG'hqt"yj g"r tqr qugf "uj kr r kpi "qhhkeg"dwknf kpi ."yj g"r tqr qugf "pgctn{"5/hv/yj kemleqo r cevgf "uxtwewtcn" hkniji qwnf "dg"r ncegf "chgt"uxtkr r kpi "cpf "r tqqh/tqnkpi 'y g"r tqr qugf "eqputvevkqp"ctgc0""

Hqt "eqput werkqp'f wtkpi 'f t { 'ugcuqpu. 'y g'uwthkekcn'cpf lqt "gzecxcvgf 'ucpf { 'uqkn''cv'y g'ukg'y knihkngn{ 'tgs wttg'' y g'cff kkqp'qh'y cvgt 'hqt 'eqo r cevkqp'r wtr qugu'f vg'vq'y g'ny 'o qkuwtg/tgvgpvkqp''ecr cek{ 'qh'y g'gpeqwpvgtgf '' ucpf u'cpf ''c ''f ggr gt ''y cvgt ''vcdng''y cv'y kni'dg''r tgugpv'f wtkpi ''y g''f tkgt ''o qpy u0'Vj g''cff kkqp''qh'y cvgt ''hqt'' eqo r cevkqp''r wtr qugu'uj qwf ''kf gcm{ ''dg''gzcnvcvgf ''d{ ''Ko rgtkcmu''i gq/vgej pkekcpu''q''cxqkf ''qxgtucwtcvkqp.'' r ctvkewrctn{ 'f wtkpi ''t tqqh/tqmkpi ''q gcvkqp0Vj g'wr gt/| qpg'uqku'uj qwf ''dg'uwthkekgpvn{ ''eqo r cevgf ''d{ ''tqqh/tqmkpi ''q gcvgvg gpv0''

Vq" r tgxgpv' ugwrgo gpv' qh' uxtwewstgu." cr r tqr tkcvg" Uxtwewstcn' Hkm' o wuv' dg" wugf ." r tqr gtn{" r ncegf ." cpf " eqo r cevgf 'cu'r gt 'y g'tgeqo o gpf cvkqpu'kp''y ku'tgr qtv0F gr gpf kpi ''qp''y g'f gr y ''qh'y g'hkm 'kw'r ncego gpv'o c{" qpn{ 'ecwug'o kpqt''ugwrgo gpv0Dcugf ''qp''y g'gpeqwpvgtgf ''ukg''uqkrieqpf kkqpu.''y g'f q''pqv'gzr gev'Uxtwewstcn'Hkm' vq''etgcvg''nqpi /vgto ''ugwrgo gpv'kuuvgu''y cv'eqwrf ''f gytko gpvcm{ 'ko r cev'y g''r tqr qugf ''uxtwewstg0''''''

Hqwpf cvkqp'F guki p'T geqo o gpf cvkqpu''

Ko"eqpukf gtcxkqp"qh"yj g"*nqqug*"ucpf { "uqknu"gpeqwpytgf "r qygpykcm{ "wr "vq"55/hv"f gr yj u."r tqxkf gf "yj g"ukyg"ku" r tgr ctgf "cu"tgeqo o gpf gf "ko"yj ku"tgr qtv."cp"cmqy cdng"dgctkpi "ecr cek{"qh"4.222/r qwpf u"r gt "us wctg"hqqv" *r uh+'ku'tgeqo o gpf gf "hqt"hqwpf cyqp"f guki p0Vj g"r tqr qugf "uj kr r kpi "qhhkeg"dwkaf kpi "ku"gzr gevgf "vq"tcpuhgt" tgrcykxgn{ "hk j v'vq"o gf kwo "mcf u"qpvq"yj g"uqkn0"Dcugf "qp"yj g"ewttgpvn{"cxckrcdng"kphqto cyqp"r tqxkf gf "d{" Umcp. "y g"j cxg"eqpukf gtgf "y g"o czko wo "y cmlmcf "cu"7/mkr "cpf "o czko wo "eqnwo p"mcf "%kh"cp{+"cu'82/mkr 0"

Eqpulf gtkpi 'ý g'ho kgf 'kphto cvkqp''r tqxkf gf 'd{ '**Uncp''**q'**Ko r gt kch**f gi ctf kpi 'ý g''eqpuvt wevkqp''qh''r tqr qugf " uj kr r kpi ''qhheg''dvkrf kpi 'y kyj 'o cuqpt{ 'y cmi'cdqwi'42/hv'j ki j .'cpf 'ý g''uvduwthceg''uqkri'eqpf kkqpu.'**Ko r gt kch'** tgeqo o gpf u'uwr r qtvkpi 'ý g''uckf ''dvkrf kpi ''qp''c''o qpqrkyj ke/urcd/o cv'***O UO** +''hqwpf cvkqp''cv'yj ku''r tqlgev'ukg0' **O UO** 'hqwpf cvkqp''ecp''dg''eqpuvt wevgf ''hqmy kpi ''ukg''r tgr ctcvkqp''kp''y g''gysvtg''dvkrf kpi ''ctgc''cpf ''7/hv''qwukf g'' ku''r gtho gvgt0'Kp''eqpukf gtcvkqp''qh''y g''hgcwtgu''qh'yj g''r tqr qugf ''dvkrf kpi ''cpf ''y g''uvduwthceg''uqkri'eqpf kkqpu''cv'' y g''ukg.''**O UO** ''hqwpf cvkqp''qh''y g''r tqr qugf ''dvkrf kpi ''cpf ''y g''uvduwthceg''uqkri'eqpf kkqpu''cv'' y g''ukg.''**O UO** ''hqwpf cvkqp''hqt''y g''r tqr qugf ''dvkrf kpi ''cpf ''g g''uvduwthceg''uqkri'eqpf kkqpu''cv'' g'' g''ukg.''**O UO** ''hqwpf cvkqp''qht'y g''r tqr qugf ''dvkrf kpi ''ecp''dg''f guki pgf ''hqt''cp''cmyy cdng''dgctkpi ''ecr cek{ ''qh'' 4.222/r uh ''r tqxkf gf ''y g''wr r gt/| qpg''uqku''cpf ''dcenhkm''ctg''r tqr gtn{ ''eqo r cevgf 0'Hqqvkpi ''f ko gpukqpu''uj qwrf '' dg'f guki pgf ''d{ ''y g''ut wewtcn'gpi kpggt ''dcugf ''qp''y g''hqcrk gf ''nqcf u''qp'kpf kxkf wcn'y cmu.'hrqqtu ''cpf ''eqnwo pu0'' "

Vj g"gzecxcvkqp"y kf yj "cpf "hgpi yj "uj qwrf "gzvgpf "c"o koko wo "qh'7/hv'kp"cm'r quukdrg"f ktgevkqpu"cy c { "htqo "yj g" hqwpf cvkqp"hqvr tkpv0Vj g"uqku"uj qwrf "dg"eqo r cevgf "vq"c"o koko wo "qh", 7"r gtegpv"qh"c"o qf khgf "Rtqevqt"ygu" *CUVO 'F 3779+'vq"3/hv"dgrqy 'yj g"gzecxcvkqp"dqvqo 0Eqo r cevkqp"xgtkhkecvkqp"yguvkpi "uj qwrf "dg"eqpf wevgf " cv"gcej "eqo r cevgf "uwthceg"cpf "3/hv"dgrqy "kv"vq"cuuwtg"yj g"uqkn"ctg"eqo r cevgf "cu"tgeqo o gpf gf 0Vj g"cf f kkqp" qh"y cvgt "cv"yj g"gzr qugf "dqvqo "uwthceg"qh"vtgpej gu"y km"pggf "vq"dg"gxcnwcvgf "d{"Korgt kcm"i gqvgej pkekcp0"



"

Cp"O UO "hqwpf cvkqp"uj qwf "eqpukuv'qh'c"yj lengpgf "r gtko gvgt"urcd"*c"j cwpej "ugevkqp+"wpf gt "yj g"gzvgtkqt" y cmu"cpf "kpvgtkqt"uvkhgpgt "dgco u"wpf gt "yj g"r ctvkkqp"cpf lqt "kpvgtkqt" y cmuODcugf "qp"yj g"guvko cvgf "mcf u." uqki'eqpf kkqpu."cpf "dwkrf kpi "f ko gpukqpu."**Ko r gt kcn**'tgeqo o gpf u"r gtko gvgt "yj lengpgf "ugevkqp"uj qwrf "j cxg" c"o kpko wo "hqqvkpi "y kf yj "qh'42/kpej "cpf "c"f gr yj "qh'42/kpej OKpvgtkqt "uvkhgpgt"dgco u"ecp"dg"34/kpej "y kf g" cpf "34/kpej "f ggr OVj lengpgf "ugevkqpu'uj qwrf "j cxg"vqr "cpf "dqwqo "tgkphqtego gpv'vq"cev'rkng"c'dgco OO UO " hqwpf cvkqp"uj qwrf "dg"f guki pgf "d{ "yj g"uvtwewtcrlgpi kpggt"dcugf "qp"yj g"hpcrk gf "mcf kpi .'wukpi "cp"cmqy cdng" dgctkpi "ecr cekv{"qh'4.222/r qwpf u"r gt "us wctg"hqqv^{*}r uh+0"

O UO 'hqwpf cvlqpu'ctg'uwr gtlqt'hqwpf cvlqp'u{ uvgo u. 'y j gp'eqo r ctgf 'vq'lpf kxlf wchhqqvlpi u. 'cpf 'ctg'hpqy p'' vq'r gthqto 'dgwgt'wpf gt'xctlcdng'cpf lqt'hqug'uwduwthceg'eqpf kxlqpu. 'y j lej 'gzkuv'cv'o quv'qh'y ku'r tqlgev'uksg0' K/ecp''cnq''ceeqo o qf cvg''wpgxgp''uwduwthceg''dgctlpi ''r tguuwtg''tguwnkpi 'htqo ''xctlcdktk{ "qh''uwr r qtvlpi ''uqkti r tqr gt vlgu0'Vq''gtlo lpcvg''y g''pggf ''hqt ''eqpuvt wevlqp''Iqlpvu. ''y g''o qpqtky le''urcd''cpf ''eqnvo p''hqqvlpi u''uj qwf '' kf gcm{ ''dg''r qwtgf ''cu''qpg''wpk0''

Vj g'o kpko wo ''go dgf o gpv'f gr yj ''qh'34/kpej ''uj qwrf ''dg''o ckpvckpgf 'hqt''**O UO** 'hqwpf cvkqp0'Vj g'tgeqo o gpf gf '' o kpko wo '' go dgf o gpv'f gr yj '' ecp'' dg'' cej kgxgf '' d{ '' r nekpi '' yj g'' Utvewtcn'' Hkm' cpf '' eqo r cevkpi '' kx.'' cu'' tgeqo o gpf gf ''kp''yj ku'tgr qtv.''r tkqt''vq''gzecxcvkpi ''hqt''y g''**O UO** ''hqwpf cvkqp0'V{r kecm{.''yj g''O UO ''tgs wktgu'c'' eqo r cevgf ''uqkn'nc{gt''qh'c''o kpko wo ''4/hn''yj kempguu''dgnqy ''yj g''dqwqo ''qh'yj g''urcd0'Vj g'f gr yj ''qh''gzecxcvkqpu'' hqt''hqwpf cvkqp''tgpej gu'y kn'xct{''y kyj ''yj g''r tqr qugf ''go dgf o gpv'f gr yj 0'''

Y g'tgeqo o gpf ''y cv'cp{ ''dqwqo ''r ctv'qh'y g''**O UO** ''hqwpf cwqp''o ckpvckpu''c''o kpko wo ''xgtween'ugr ctcwqp''qh'' 3/hv'q''y g''UI Y VOC''o kpko wo ''xgtween'ugr ctcwqp''qh'4/hv'uj qwrf ''dg'o ckpvckpgf 'htqo ''y g''dqwqo ''qh''cp{ ''hrqqt'' urcd''cpf ''y g''UI Y V''vq''r tgxgpv''ko r cewu''qh''i tqwpf y cvgt0'Vj g''UI Y V''ku''guvko cvgf ''vq''dg''cv''o qtg''y cp''307/hv'' f gr yj ''dgrqy ''y g''gzkuvkpi ''i tcf gu0'Cf lwuv''y g''hkpkuj gf ''i tcf gu''cpf ''r reeg''cf f kkqpen'eqo r cevgf ''hkm''cdqxg''y g'' gzkuvkpi ''i tcf gu''q''ucvkuh{ ''y g''xgtvkeen'ugr ctcvkqp''cpf ''go dgf o gpvt'gs wktgo gpw0''

Ukvg'Engctkpi''

Rtkqt'\q'cp{ 'eqput vevkqp.'y g'ukg'o wuv'dg'r tqr gtn{ 'r tgr ctgf 0Vq'r tgr ctg'y g'ukg'hqt'eqput vevkqp.'cm'gz kuvkpi " qduxt vevkqpu'^sg0 0'gz kuvkpi 'eqpet gvg'qt'cur j cnx.'dcug'o cvgtkcn'cp{ "qrf 'hqwpf cvkqpu.'o wem'f gdtku.'x gi gvcvkqp." cpf "ncti g"tqqvu'f qy p"vq"hkpi gt"uk g+"uj qwrf "dg"tgo qxgf.''kpenvf kpi "kp"c"7/hv"o cti kp"kp"gxgt { "r quukdrg" j qtk qpvcn'f ktgevkqp"cy c{ 'htqo 'vj g'hqqvr tkpv'qh'vj g'r tqr qugf 'dvkrf kpi 0'Qpeg'vj g'ukg'ku'engctgf 'cpf 'gz kuvkpi " tqemluj gm'tgo qxgf.''y g'ctgc''uj qwrf ''dg''eqo r cevgf 'cu'r gt''y g'r tqqh/tqmkpi ''ugevkqp'i kxgp''dgrqy 0"

Rt qqh/t qmlpi ''

C'r tqqh/tqnkpi 'r tqi tco ''uj qwf ''dg''eqpf wevgf ''qnqq kpi 'r tqr gt''engctkpi ''cpf 'tgo qxcn'qh'gzkukpi 'r cxgo gpv0' F wg''q''y g'o qf gtcvg''ucpf {''uqknı'kp''y g''wr r gt/| qpg''cv'y ku''ukg.''y g''cf f kkqp''qh''uki pkhecpv'co qwpuu'qh'y cvgt''' y kn'' dg'' tgs wktgf '' f wtkpi '' r tqqh/tqnkpi '' cpf '' eqput wevkqp'' f wtkpi '' ft {'' ugcuqpu0' Cp'' Ko r gt kmu'' hkgf '' tgr tgugpvcvkxg''ecp''cuegtvckp'kh'cpf ''j qy ''o wej 'y cvgt''ku'tgs wktgf ''qt''r tqr gt''eqo r cevkqp0''Xkdtcvqt {''tqnkpi ''ku'' y g''r tghgttgf ''o gy qf 0'Rtqqh/tqnkpi ''uj qwf ''dg''f qpg''vukpi ''c''ncti g''xkdtcvqt {''tqngt''*uwej ''cu''F { pcr ce''EC47'' qt''uko krct+'y kj ''c'o kpko wo ''qh'42.222/nd''ecr cekk{.''wpguu'y g''necvkqp''ku'y kj kp'42/hv'qh'cp''gzkukpi ''dwkf kpi '' *'qt+'' ucwtcvgf ''uqkni''o cmg'' xkdtcvqt { ''eqo r cevkqp'' pqv' hgcukdng0' Eqput wevkqp'' kp'' y g'' y gv''ugcuqp''o c { ''dg''' eqo r nhecvgf ''d { ''c'uj cmyy ''y cvgt ''cdng''pgeguukcvkpi ''ucvke''tqnkpi ''gej pk wgu0'''

Ki'y g'uqku'ecppqv'dg"ghbgevkxgn{ 'eqo r cevgf 'f wg'\q'uqkno qkuwtg.'y gp'uxvke'tqmly g"gpvktg'ctgc0Uxvke'tqmkpi " y kj "c"ncti g"f wo r "vtweni'qt"ncti g"ncf gt"cpf "hwni'dwengv'qh'uqkn0'Uxvke''tqmlpi "ecp"cnq"dg"wugf "vq"no k/ xkdtcvqt { 'ko r cevu'qp''y g"gzkuvkpi "dwknf kpi 0'Ki'uxvke''tqmkpi "ku''cr r ngf "c"uki pkhecpv''co qwpv'qh'vko g"ecp''dg" gzr gevgf 'vq''eqpuqnkf cvg''y g'ny gt'nc { gtu'qh'uqkn'vq''qpg'hqqv'dgny 'vj g"gzr qugf "uwthceg0"



Rtqqh/tqm'cu'pggf gf ''wpvki'y g''uqku''ctg''eqo r cevgf ''q''c''o kplo wo ''qh''; 7''r gtegpv'qh''c''o qf khgf ''Rtqevqt ''yuv'' *CUVO 'F 3779+'\q'3/hv'dgmy ''y g''gzecxcvkqp''dqwqo 0Eqo r cevkqp''xgtkhecvkqp''yuvkpi ''uj qwf ''dg''eqpf wevgf '' cv'gcej ''eqo r cevgf ''uwthceg''cpf ''3/hv'dgmy ''kv''q''cuuwtg''y g''uqku''ctg''eqo r cevgf ''r gt ''y ku''tgr qtv0'Vj g''uqku'' uj qwf ''dg''o ckpvckpgf ''y kij kp'5'r gtegpv'qh'qr vlo wo ''o qkuwtg''cu''guvcdrkuj gf ''d{ ''y g''o qf khgf ''Rtqevqt''f wtkpi '' eqo r cevkqp0'Cp{ ''nqecn\ gf ''nqug''ctgcu''cpf kt''uqkr'r wo r kpi ''wpf wrcvkqpu''uj qwf ''dg''tgr qtvgf ''q''Ko r gt kmu'' vgej pkekcpu'hqt''c ''nµmy ''wr 0'Vj g''uksg''uj qwf ''dg''yguvgf ''gxgt { ''7.222/hv⁴'kp''y g''eqpuvtwevkqp''ctgcu'qt''c''o kpko wo '' qh'5''yguvu'r gt''r tgr ctgf ''r cf 0Gcej ''j gcxkn{/mcf gf ''eqnwo p''qt''gs wkr o gpv'r cf ''uj qwf ''dg''yguvgf ''hqt''xgtkhecvkqp'' qh'cej kgxgf ''eqo r cevkqp0''''

Vj g'ugcuqpenij ki j /y evgt'vedng'*UJ Y V+ku'gzr gevgf 'vq'dg''ev'o qtg''y ep'307/hv'f gr yj 'dgnqy 'vj g'gzkuvkpi 'i tef gu0' Y g'uwi i guv'eqpf vevkpi 'vj g'ukvg''r tgr etevkqp''kp''e''f t{ 'ugcuqp''vq''exqkf 'f gy evgtkpi ''qh''y g''ukvg''e'' tqr gtn{" eqo r cev'yj g''uqknu0'Ku'pgeguuet{.'vj g''dqvqo ''qh'yj g''gzeexevkqp''uj qwrf ''dg''eqo r cevgf ''wukpi ''uo emgt''xkdtevqt{" eqo r cevqtu''qt''uvevke''tqmkpi ''vgj pls wgu''wpvkn'yj g''uqknu''etg''uwhhelgpvn{"eqo r cevgf 0"'

Eqo r cevkqp"o c{"dg"eqo r necvgf "d{"y g"r tgugpeg"qh'ucwtcvgf "uqkn0'Kb'ucwtcvgf "uqkni'ctg"r tgugpv."y g"uqkn' eqo r cevkqp"ecp"dg"eqphto gf "d{"vulpi "c"Ucvke'Eqpg'Rgpgvtqo gvgt "&UER+0Eqo r cev'y g"gzr qugf "uqkni'wpvkn' c"o kplo wo "qh'47/m ko ⁴"r tguuwtg"ku"tgi kuvgtgf "qp" y g"f kcn'i cwi g0'F gy cvgt" y g"eqo r cevgf "ctgc"kh" y g" o kplo wo "UER'xcnwg"ecppqv'dg"cvckpgf 0Kpuvcmiuqenif tckpu"cvcej gf "\q"r wo r u'hqt 'uj cmqy 'f gy cvgtkpi 0Y gm' r qkpvkpi 'ecp"cmq'dg'wknk gf 0Eqpuwn/c'f gy cvgtkpi 'ur gekcnkuv'\q'f guki p'y g'o quv'ghbgevkxg'f gy cvgtkpi 'u{uvgo " dcugf 'qp''y g'uqki'eqpf kkqpu0'

Ut we wet cri Hkmi"

F ghtpkkqp"

Uqhni'wugf "cu'uxt wewtchlkm'uj qwf "dg"engcp"hkpg"ucpf u"eqpvckpkpi "nguu'ij cp"34"r gtegpv'o cvgtkch*d{ "y gki j v+" yj cv'ku'hkpgt 'ij cp'%422"ukgxg"*hkpgu+:"o cvgtkch'eqphqto kpi "vq"UR'vq"URIUO "r gt 'ij g"WUE UVCp{ "uxt wewtchlkm' uj qwf "pqv'gzeggf "7"r gtegpv'qti cpkeu0'Uqkni'kp"ij g"vqr/| qpg"qh'ij g"ukg"cr r gct"vq"dg"i gpgtcm{ "uvkscdng"hqt" cr r nkecvlqp"cu'uxt wewtchlkm0'Vj g"hkpgu'eqpvgpv'cpf "qti cpke"eqpvgpv'tgs vkt g"xgtkhkecvlqpu'dghtg"wug"qh"cp{ qp/ukg"qt"gzecxcvgf "uqkni'hqt "uxt wewtchldcenhkm0'Qpn{ "UR'qt"URIUO "uqkni'uj qwf "dg"eqpukf gtgf "hqt"wug"cu" uxt wewtchldcenhkm0Kpur gev'cm'gzr qugf "uqklic{gtu"cv'ij ku'ukg'hqt "hkpgulqti cpke"eqpvgpv'cpf "eqpf wev'ncdqtcvqt{" vguvkpi "cu'pggf gf "kh'ij g"uqkni'ctg'r tqr qugf 'hqt"wug"cu'uxt wewtchlkm0""

Rrcego gpv"

Ut wewt crihkniuj qwrf "dg'r negf 'kp'hkuu'pqv'\q"gzeggf "3/hv'yj kentiVj g'uqknu'uj qwrf "dg"eqo r cevgf '\q"cv'ngcuv'; 7" r gtegpv''qh''kuu'o qf khkgf "Rtqevqt" o czko wo "ft { "f gpuks{ "*CUVO 'F 3779+0'Eqphkpgf "ctgcu"uwej "cu"wktks{ " vtgpej gu" uj qwrf "dg" eqo r cevgf " y kyj " o cpwcm{ "qr gtcvgf " xkdtcvqt { "eqo r cevkqp" gs vkr o gpv0' C" vguvkpi " htgs wgpe { "qh'qpg" vguv'r gt "7.222/us wctg" hggv''uj qwrf "dg" eqpf wevgf "kp" yj g"r tqr qugf "eqpuvt wevkqp" ctgc" qt "c" o kpko wo "qh'5" vguvu'r gt "r tgr ctgf "r cf. "y j kej gxgt" ku'i tgcvgt0"

 $Cp \{ "j gcxkn \{ "nqcf gf "ctgcu"uj qwf "dg"tg/eqo r cevgf "chvgt "gzecxcvkpi "vq"cuuwtg"eqpukuvgpv"eqo r cevkqp0"Vj g" gzr qugf "uwthcegu"qh"hqwpf cvkqp "vtgpej gu"uj qwf "dg"eqo r cevgf "y kj "c"ncti g"r ncvg"eqo r cevqt0"Vj g" r ncvg" eqo r cevqt'uj qwf "dg"c'f kgugn'v{r g'wpk/y kj "c"o kpko wo "42/kpej 'y kf g"r ncvg0"C"Iwo r kpi 'lcem'eqo r cevqt "ecp" cnvq"dg"wugf "r tqxkf gf "vj g"o qkuvwtg"eqpvgpv"ku"eqpvtqngf 0"Vj g" j gcxkn{"nqcf gf "ctgcu"uj qwf "dg"eqo r cevqf "gy kj g"r ncvg0"C"Iwo r kpi 'lcem'eqo r cevqt "ecp" cnvq"dg"wugf "r tqxkf gf "vj g"o qkuvwtg"eqpvgpv"ku"eqpvtqngf 0"Vj g" j gcxkn{"nqcf gf "ctgcu"uj qwf "dg"eqo r cevqf "gy kj g"r ncvg0"C"Iwo r kpi 'lcem'eqo r cevqf "cvqf" myvki'y g"uqktivq "3/hv'dgmy "y g"nqwf cvkqp"dqwqo "ku"eqo r cevqf "q"; 7"r gtegpv'qh"o qf khvgf "Rtqevqt "%CUVO "F 3779+0Vj kemgpgf 'r gtko gvgt 'uncd/hqqvqpi "ctgcu"uj qwf "dg"vguvgf "cv'htgs wgpe { "qh'3'vguvggt { '72'hpgcn'hggv0" "$

Cp{"wkrkskgu"uj qwrf "dg"r ncegf "wukpi "uwkscdng"uvt wewstch'hkm'cpf "eqor cevgf "vq" Hnqtkf c"F gr ct vo gpv'qh' Vtcpur qt vcvkqp"*HFQV+"cpf lqt "nqechtgs wktgo gpvu0Cp{"dgf f kpi "uqkn'uj qwrf "dg"eqor cevgf."qt "c'uvqpg"dcug"



hqwpf cvkqp "wugf "kh"y gy'eqpf kkqpu"ctg"r tgugpv0'Vj g"uqki"hqt" wkkk{ "vtgpej gu"cpf kqt" wkkk{ "utvewtgu"kp"yj g" r cxgf "ctgcu'uj qwf "dg"r megf "kp"pq"o qtg"yj cp"34/kpej "khvu"cpf "eqo r cevgf 'vq"c"o kpko wo "qh"322"r gtegpv'qh" c"uvcpf ctf "r tqevqt"*CUVO 'F 8; : +0'Wkkk{ "utvewtgu"uj cm"dg"vguvgf "gxgt { "hqqv"qp"c"o kpko wo "qh"qpg"ukf g0' Rkr kpi "f gpukkgu"y km"f gr gpf "qp"ukt g"cpf 'v{ r g"qh"r kr g0'Ncti g"cpf "tki kf "r kr gu"y km"tgs wktg"ur tkpi "hqpg"vguvkpi " gxgt { "8/kpej "vq" yj g" vqr "qh" yj g" r kr g" cpf "gxgt { "hqqv" yj gtgchvgt0'Hqt" uo cmgt "r kr gu. "uqkt" y km" pggf "vq" dg" eqo r cevgf 'c'o kpko wo 'qh"3/hv'cdqxg'yj g'r kr g0T ghgt 'vq' yj g'r kr g'o cpwhcewtgt"ur gekhecvkqpu'hqt "hvt y gt f gvckt" qp"cmqy gf "eqo r cevkqp"gs wkr o gpv'cpf 'r mego gpv'vgej pks wgu0Vj g'htgs wgpe { "qh'r kr g'vguvkpi 'y km"dg'r gpf kpi " y g"m { qw. "dwv"cv'hgcuv'qpg"vguv'uj qwf "dg"vcmgp"r gt kpf kxkf wcn'r kr g'twp"qt "gxgt { "322"hpgcnhggv0'

Ki'y g"eqput wexkqp"vcngu"r nceg"kp"c"y gv'ugcuqp."f gy cygtkpi "o c{"dgeqo g"tgs wktgf "vq"r tqr gtn{"r tgr ctg"y g" ukg0"Kp"ecug"f gy cygtkpi "dgeqo gu"guugpvkcn"y g"I Y V'uj qwrf "dg"eqpvtqngf "wukpi "uqeni'f tckpu"cpf "r wo r u0' Y gm'r qkpv'u{uvgo u"ecp"dg"wugf "hqt"f ggr gt "f gy cygtkpi "cr r nkecvkqpu0'C"f gy cygtkpi "eqpvtcevqt"y km'pggf "vq" f gygto kpg"y g"o quv'ghbgevkxg'u{uvgo "dcugf "qp"y g"ukwg"eqpf kkqpu"cpf "r tqr qugf "f gy cygtkpi "f gr y 0'Vj g'hkpcn" f guki p"grgxcvkqpu"qh'y g"dwkrf kpi "cpf "f gr y u"dgrqy "i tcf g"uj qwrf "dg"gxcnwcygf "f wtkpi "y g"dkf f kpi "r tqeguu"vq" ceeqwpv'hqt"cp{"r qygpvkcnif gy cygtkpi "tgs wktgo gpvu0'

Kp"ecug"qh'uj cmqy "UJ Y V"kp"yj g"eqpuvtwevkqp"ctgc"f vg"vq"eqpuvtwevkqp"vcmgp"vr "f wtkpi "c"y gv'ugcuqp. "yj g" dqvqo "qh'gzecxcvkqp"o c{"gpetqcej "qp"yj g'y cvgt"vcdng0Kkiuqkrieqo r cevkqp"ku"pqv'c'xkcdrg"qr vkqp. 'f vg'vq'uqkri ucwtcvkqp"htqo "c"uj cmqy "y cvgt"vcdng."yj gp"cp"ci i tgi cvg"dcug"ecp"dg"wkrk{ gf "kp"yj gug"ctgcu0'Tgo qxg" ucwtcvgf "uqkru"vq"3/hv'dgrqy "yj g"gzecxcvkqp"cpf "tgr reeg"y kj "%79"uvqpg."dw'uqkri"eqo r cevkqp"uj qwrf "dg" cvgo r vgf "cu'yj g"r tghgttgf "qr vkqp0'Vj g"ctgcu'uj qwrf "dg"ko o gf kcvgn{"htpgf "y kj 'O ktchk'P /Ugtkgu'hkngt 'hcdtke." uvej "cu'yj g"392P "qt"gs vkxcngpv."y kj "gpqwi j "qxgtrcr "vq"gpvktgn{"gpecug'y g'34/kpej "tqenihc {gt0Vj g"qxgtrcr " cdqxg"y g"tqenihc {gt"uj qwrf "dg"o kpko wo "34/kpej "yj ken0/Eqo r cevkqp"qh'yj g"tqenihu"pqv'pgeguuct {."dwi'yj g" tqenihuj qwrf "dg"r tguugf "f qy p"y kj "yj g"gzecxcvqt"dwengv'vq"cuuvtg"cmixqkf "ur cegu"ctg"hkngf "y kj "tqen0/Uqkri" eqo r cevkqp"uj qwrf "tgo ckp"cu'yj g"htuv'cngtpcvkxg0'Wug"nqecrk{ gf "f gy cvgtkpi "cu"pgeguuct {"vq"r tqxkf g"c"ft {" y qtmkpi "r whqto 0""""

Uvqto y cvgt 'Rqpf 'Eqpulf gt cvkqpu''

Dqt\pi u'**RD/3'**'j tqwi j **'RD/8'**'y gtg'f tkmgf '\q'j g'uco g'\gto \pcv\qp'f gr y '\qh'34/hv\\p'j g'r tqr qugf '\uqto y cvgt'' r qpf ''ctgcu'mqevgf '\p'j g'gcuv.'uqwj gcuv/uqwj ."cpf ''y guv'r qt\qpu'qh'j g'r tqlgev'u\\g0\\p6''j gug'r qpf ''dqt\pi u." r qqtn{/i tcf gf "engcp"\q'enc { g{ "h\pg''ucpf u"*UR.''URIUO .''UO .''UO 1UE.''UE+''y gtg''gpeqwpvgtgf 0'Enc { g{ ''ucpf u'' *UE+''y gtg''gpeqwpvgtgf 0'Enc { g{ ''ucpf u'' r qpf u'' c''ccp''g''ucgf ''f wt\pi ''ukg''qputveykqp0'' u'' tqf veg''uqo g''utvewtcn'h\n''y cv'ecp''g''ugf ''f wt\pi ''ukg''qputvekkqp0'

Uj grd{'wdg'uco r ngu'*UVu+: 'hcdgngf ''cu'**RJ** /3'cpf '**RX**/3.'cpf '**RJ** /4'cpf '**RX**/4.'y gtg'eqngevgf ''d{ ''gzecxcvkpi '' uj cnqy ''r ku'vq'52/kpej 'f gr y ''pgct''y g''pqt y gcuvgtp ''gpf ''qh'r tqr qugf ''r qpf ''422'cpf ''q'58/kpej 'f gr y ''pgct''y g'' uqwj gtp''gpf ''qh'r qpf ''322.'tgur gevksgn{0'Ncdqtcvqt{ ''r gto gcdkrkv{ ''guvu'eqpf wevgf ''qp'UVu'{ kgnf gf ''j qtk qpvcn'' r gto gcdkrkv{ ''xcnwgu''tcpi kpi ''htqo ''205/hv/f c{ ''q''504/hv/f c{.''cpf ''xgtvkecn''r gto gcdkrkv{ ''xcnwgu''tcpi kpi ''htqo '' 205/hv/f c{ ''q''; 04/hv/f c{0''

Vj g''wr r gt ''uqkn''uj qwf ''dg''r tqr gtn{ ''uvtkr r gf ''r gt''r tgxkqwu''tgr qtv''ugevkqpu''r tkqt''q''gzecxcvkpi ''hqt''r qpf u0'Cu'' y g''f kf ''pqv''gpeqwpvgt''cp{ ''hcv'erc{u''*wr ''vq''34/hv'f gr yj ''dgrqy ''y g''gzkuvkpi ''i tcf gu+."eqphkpkpi ''rc{gtu''ctg''pqv'' gzkuvkpi ''y kj kp''y g''gzr rqtgf 'f gr yj ''qh''34/hv'kp''y g''ctgcu''r tqr qugf ''hqt''y g''uvqto y cvgt''r qpf u0'Vj g''ugcuqpcn'' j kj /y cvgt''ccdrg'*UJ Y V+'ku''cv'f khtgtgpv'f gr yj u'xct{kpi ''htqo ''307''vq''5/hv'f gr yj ''dgrqy ''y g''gzkuvkpi ''i tcf gu''kp'' y g''ctgcu''r tqr qugf ''hqt''y g''uvqto y cvgt''r qpf u'cv'y ku''r tqlgev'uksg0'Vj g''uqkn'r tqhkrgu'qh''qtkpi u''RD/3''y tqwi j '' RD/8. ''rcdqt'' gr y g''gr qust''r tgxkqwun{ ''f guetkdgf ''kp''y ku''tgr qtv."cpf ''y g''hqcn'vqr qi tcr j { ''uj qwf '' cmq''ge'qpukf gtgf ''kp''f guki pkpi ''y g''r tqr qugf ''uqto y cvgt''r qpf u'cv'y ku''tgr qtv."cpf ''y g''hqcn'vqr qi tcr j { ''uj qwf '' cmq''ge'qpukf gtgf ''kp''f guki pkpi ''y g''r tqr qugf ''uqto y cvgt''r qpf u'cv'y ku''tgr qtv."cpf ''y g''hqcn'vqr qi tcr j { ''uj qwf '' cmq''ge'qpukf gtgf ''kp''f guki pkpi ''y g''r tqr qugf ''uqto y cvgt''r qpf u'cv'y ku''ugo''

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GZECXCVKQP'UCHGV["

Kp"yj g"Hgf gtcnlTgi knygt."Xqnvo g"76."P q042; "*Qevqdgt"3; : ; +."yj g"WU'F gr ctvo gpv'qhl"Ncdqt."Qeewr cvkqpcn" Uchgv{"cpf "J gcnj "Cf o kpknvcvkqp"*QUJ C+"co gpf gf "ku"õEqpuvtwevkqp"Ucpf ctf u"hqt "Gzecxcvkqpu."4; "EHT." Rctv'3; 48."Uvdr ctv'RööVj ku"f qevo gpv'y cu"kunvgf "vq"dgvygt "gpuvtg"yj g"uchgv{"qh"y qtno gp"gpvgtkpi "vtgpej gu" qt "gzecxcvkqpu0Ki"ku"o cpf cvgf "d{"vj ku"hgf gtcnl*gi vncvkqp"vj cv"gzecxcvkqpu."y j gvj gt"yj g{"dg"vvkdv{"typej gu." dcugo gpv"gzecxcvkqpu"qt "hqvpf cvkqp"gzecxcvkqpu."dg"eqpuvtwevgf "kp"ceeqtf cpeg"y kj "yj g"cr r nkecdrg"QUJ C" i vvk gnkpgu0'Ki"ku"qvt "vpf gtuvcpf kpi "vj cv"yj gug"tgi vncvkqpu"ctg"dgkpi "uvtkevn{"gphqtegf "cpf "kh"yj g{"ctg"pqv" uvtkevn{"gphqtegf."yj g"qy pgt"cpf "eqpvtcevqt"eqwf "dg"hcdng"hqt"uvdvcpvkcn" gpcnkgu0'

Vj g"eqpvtcevqt"ku"uqngn{"tgur qpukdng"hqt"f guki pkpi "cpf "eqpuvtwevkpi "uvcdng."vgo r qtct {"gzecxcvkqpu"cpf" uj qwrf "uj qtg."urqr g."qt"dgpej "y g"ukf gu"qh"y g"gzecxcvkqpu"cu"tgs wktgf "vq"o ckpvckp"uvcdktkv{ "qh"dqy "y g" gzecxcvkqp"ukf gu'cpf 'dqwqo 0Vj g'eqpvtcevqtu"ötgur qpukdng"r gtuqpuö."cu'f ghkpgf 'kp'4; 'EHT'Rctv'3; 48.'uj qwrf " gxcnwcyg'y g'uqkn'gzr qugf 'kp'y g"gzecxcvkqpu"cu'r ctv'qh'y g"eqpvtcevqtøu'uchgv{ "r tqegf wt gu0Kp'pq"ecug'uj qwrf " urqr g'j gki j v.'urqr g'kpenkpcvkqp."qt"gzecxcvkqp"f gr y .'kpenwf kpi 'wkrkv{ "vtgpej "gzecxcvkqp"f gr y .'gzeggf 'yj qug" ur gekhlef 'kp'cp{ 'mecn'uvcyg."cpf 'hgf gtcnluchgv{ 'twgu'qt'tgi wncvkqpu0'Y g'ctg'r tqxkf kpi 'y ku'kphqto cvkqp"uqnn{" cu'c"ugtxkeg"vq"qwt"enkgpv0Ko r gt kcn'f qgu"pqv'cuuvo g"cp{ "tgur qpukdkrkv{ "hqt"eqpuvtwevkqp"ukg"uchgv{"rtj y g" eqpvtcevqtøu"qt"qy gt 'r ctv{øu"eqo r nkcpeg"y ky 'mecn"uvcyg."cpf 'hgf gtcn'uchgv{ 'twngu'qt"qy gt 'tgi wncvkqpu0'

RCXGO GP V'T GE QO O GP F CVKQP U'

Uqkı'dqtkpi u"**TD**/3''y tqwi j '**TD**/33''y gtg"f tkmgf "wr "q"c"eqpucpv''gto kpckqp"f gr y "qh"32/hv'kp"y g"ctgcu" r tqr qugf "hqt"r cxgo gpw"cv'y ku''r tqlgev'ukg0'O quv'qh'y g"uqku"ctg"r qqtn{/i tcf gf "urki j w{"uknv{"q"uknv{"hpg" ucpf u"*URIUO "qt"UO + y qwi j "uwthekcn'mc {gtu''y gtg"hqwpf "q"eqpvckp"tqemluj gm"kp"uqo g"dqtkpi u0'Vj g"uqku" qhgtgf "o quvn{"o kplo cn'tgukucpeg''q'j cpf "cwi gt"f tkmkpi "kp"y g"wr r gt"6/hv'f gr y 0'URV'P/xcnwgu'y gtg'kp'yj g" tcpi g"qh"6''q"32/hv'f gr y u0'Vj g"f cw"kpf lecvgu''y g"uqku"kp"y g"wr r gt/| qpg"qh"y g"r tqr qugf "r cxgo gpv'ctgcu"ctg"o quvn{"kp"c"nqqug" q"o gf kwo "f gpug"eqpf kkqp0'Vj g"r cxgo gpv'ctgcu''uj qwf "dg"uxtkr r gf " cpf 'r tqqh/tqmgf "cu'f guetkdgf 'kp'y g"r tgxkqwu'ugevkqpu'qh'y ku'tgr qtv0'

Korgt kchtgeqo ogpfu'ý cv'c'o kpko wo 'ugr ctcvkqp'qh'3/hv'dg'o ckpvckpgf 'dgw ggp'ý g''dqwqo 'qh'ý g''t tqr qugf " dcug"cpf "ý g"ugcuqpch'j ki j /y cvgt "vcdng"*UJ Y V+"kh''tge{engf "etwuj gf "eqpetgvg"ku"wugf 0'C "no gtqem''dcug" cr r necvkqp'y km'tgs wktg'c'o kpko wo 'ugr ctcvkqp''qh'307/hv0Cu'ý g''UJ Y V'ku''guvko cvgf ''q''dg''cv'o qtg''y cp''307/ hv'f gr ý u''dgmyy ''ý g''gzkuvkpi ''i tcf gu. ''ý g''tgeqo o gpf gf "xgtvkecn'ugr ctcvkqp"ecp''dg''cej kgxgf ''hqt "gký gt ''dcug" o cvgtkcn0'**Uncp''** j cu''tgs wguvgf "eqpetgvg''r cxgo gpv'tgeqo o gpf cvkqpu''hqt "kpvgtpcn'tqcf u''cu''j gcx{/vtchke''ku'' cpvkekr cvgf ''htqo hq'' ý g''qwf qqt "uqtci g''ctgcu0'**Uncp**''cpvkekr cvgu''o gf kwo /f w{ "vtchke"y kj kp''y g''qwf qqt " uvqtci g''ctgcu ý cv'y km'dg''ceeguugf ''d{ ''ý g''tvemt0''

Cpvkekr cvgf "vtchke"v{r g"cpf "htgs vgpe{ "htt"yj g"go r m{gglxkukqt"r ctmkpi "mv"j cxg"pqv"dggp"r tqxkf gf "vq" Korgt kch)'Vj gtghtg."y g"cuuwo g"ni j v"vtchke"htt"yj g"r tqr qugf "r ctmkpi "mv"qp"yj g"gcuv"ukf g"qh"yj g"uj kr r kpi " qhheg"dvkrf kpi 0'Hqt"c"r cxgo gpv"f guki p"nkhg"qh"42"{gctu."kp"f wg"eqpukf gtcvkqp"qh"yj g"uvduwthceg"eqpf kkqpu" cpf "vtchke"kphqto cvkqp"f guetkdgf "cdqxg."y g"tgeqo o gpf "yj g"hqmqy kpi "curj cn/"r cxgo gpv"ugevkqp"hqt"yj g" r tqr qugf "go r m{gglxkukqt"r ctmkpi "mv0'

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Automatical and a set of the set of the

]	Nki j √f wv{ 'Rcxgo gpv'Ugevkqp'kp'vj g'Gornq{ ggIXkdsvqt 'Rctmkpi 'Nqv'' Ugevkqp'Wakpi 'Dcug'cpf 'Uvcdkd≰ gf 'Uwditcfg"	O lplo wo '' Vj lenpgul'%pej +''						
Uwthceg'' Eqwtug''''''	Cur j cn/'Uwr gtr cxg''Uwthceg''/ 'V{r g''UR/; 07''qt '3407 'Hkpg. ''Vtchhke''ngxgn'õEö0'''''''''''' Utwewtcn'Eqghhekgpv*2066+'*307/kpej +'? '*2088+''	" 307"						
Dcug'' Eqwtug" "	Nko gtqenij cxkpi "c"o koko wo "NDT"qh'322"cpf "eqo r cevgf "\q"cvhgcuv"; : "r gtegpv"" qh'HO 7/7370"Ut wewt cn'Eqghhelgpv*208: +**8/kpej +'? "*302: +" """""""""""""""""""""""""""""""""""	8"						
Uwdi tcf g" "	Uvcdkrk gf, "vq"c"o koko wo "NDT"qh'62"cpf "eqo r cevgf "vq"cv'rgcuv'; : "r gtegpv'qh" HO 7/7370"""Ut wewt cn'Eqghhekgpv'*202: +'*34/kpej +'? '*20 8+"	34"						
	VqvcnUvt wevwt cnE qghhelgpv'? '4092"							

, T gs włtgu'd ngpf kpi "gkj gt 'erc {. 'uj gm 'qt 'iko gtqemi*qt 'gs wkx cngpv+'y kj 'kp/r rceg'uwthekcriucpf 0V{r kecrieqo r qukg'uco r ngu'ctg''eqo r tkugf ''qh'72' 'kp/r rceg'ucpf "cpf "72' 'ko r qt vgf ''uxcdkł; cvłqp''o cvgtkcri*erc {. 'uj gm 'iko gtqemi'qt ''gs wkxcngpv+0'''

Hqt"c"r cxgo gpv'f guki p"nkhg"qh'42" { gctu."kp"f wg"eqpukf gtcvkqp"qh" y g"uvduwthceg" cpf "vtchhe"eqpf kkqpu" f guetkdgf "cdqxg."y g"tgeqo o gpf "y g"hqmqy kpi "o gf kwo /f wx{"r cxgo gpv'ugevkqp"y ky "cp"cur j cnv'uwthceg"hqt" y g"qwf qqt"uvqtci g"ctgcu0'

	'''''O gf kwo /f w{ 'Rcxgo gpv'Ugevkqp'kp'Qwvf qqt 'Uvqt ci g'Ct gcu'' Ugevkqp'Wukpi 'Dcug'cpf 'Uvcdkkk gf 'Uwdi t cf g''	O lplo wo '' Vj lenpgul'*lpej +''						
Uwthceg'' Eqwtug''''''	$\label{eq:curjcn} Curjcn/Uwrgtrcxg''Uwthceg''/'V{rg''UR/;07''qt''3407''Hkpg.''Vtchhe''ngxgn'oEö0'''''Utwewtcn'Eqghhekgpv'*2066+'*4/kpej+'?'*20:+''$	" 4"						
Dcug'' Eqwtug" "	Nko gtqenij cxkpi "c"o koko wo "NDT"qh'322"cpf "eqo r cevgf "vq"cv'hgcuv"; : "r gtegpv"" qh'HO 7/7370"Ut wewt cn'Eqghhelgpv*208: +**: /kpej +"? "*3066+" "UT" Et wij gf "Eqpetgvg"j cxkpi "c"o koko wo "NDT"qh'372"cpf "eqo r cevgf "vq"cv'hgcuv"; : " r gtegpv'qh'HO 7/7370"Ut wewt cn'Eqghhelgpv*208: +**: /kpej +"? "*3066+"	:"						
Uwditcfg"	Ucdktk gf, "\q"c"o kpko wo "NDT"qh'62"cpf "eqo r cevgf '\q"cvhgcuv'; : "r gtegpv'qh" HO 7/7370"'''Ut wewt cn'Eqghhekgpv*202: +*34/kpej +\? '*20, 8+"	34"						
	VqvcriUvt wevwt criEqghblelgpv'? '504: "							

, Tgs wktgu'dappf kpi "gkj gt "enc{.''uj gm 'qt ''ko gtqenti%qt ''gs wkxcappv#'y kj 'kp/r neg''uwthkekch'ucpf 0'V{r kech'eqo r qukg''uco r ngu'ctg''eqo r tkugf ''qh'72' ''kp/r neg''ucpf ''cpf ''72' ''ko r qtygf ''uvcdkkt cytqp'o cysticn*'enc{.''uj gm ''ko gtqentiqt ''gs wkxcappv#0'''

Y g'tgeqo o gpf 'wukpi ''c'eqpetgvg''r cxgo gpv^{*}tki kf 'r cxgo gpv+'hqt 'y g'kpvgtpcn'ceeguu'tqcf u''cv'y ku''r tqlgev'ukg0' Eqpetgvg''r cxgo gpv'ugevkqpu''tcpuhgt 'uo cngt 'o czko wo ''uvtguugu''q'y g'wpf gtn{ kpi ''uqku''y cp'hrgzkdng''cur j cn'' r cxgo gpv'ugevkqpu0"C''r cxgo gpv'f guki p''gpi kpggt ''uj qwrf ''f guki p''y g''tgs wktgf ''y kenpguugu''qh''eqpetgvg''rc {gt.'' dcug''rc {gt''qh''gky gt "etwuj gf "eqpetgvg''qt''uj gm''cpf "uvcdkrk gf "uvdi tcf g.''kp''f wg"eqpukf gtcvkqp''qh''y g''uqkrl'' r tqhkrgu''f guetkdgf ''kp''y g''nqi u''qh''dqtkpi u''TD/3''y tqwi j "TD/33''cpf "gzr gevgf "rqcf u''qp''y g''uqkrl'htqo "y g'' cpvkekr cvgf ''wg0''

Vj g"uqku"dgpgcyj "yj g"eqpetgyg"r cxgo gpwl"uj qwf "dg"uxcdktk gf "dw"o wuv'r tqxkf g"i qqf "f tckpci g0'V{r kech' uxcdktk cvkqp"eqo r tkugu"qh"c"34/kpej "nc { gt "qh"uqkt"uxcdktk gf "vq"c "o kpko wo "NDT"qh"620'Uxcdktk cvkqp"ecp"dg" eqpf wevgf "dwl'yj g"uqkul"uj qwrf "pqv'dg"uxcdktk gf "vq"gzeggf "NDT"xcnwg"qh": 2"cu"j ki j gt"NDT"o c { "tgf weg"yj g" f tckpci g0T go kz "yj g"ctgc"y kj "ucpf "kh"c"gcpgt"o kz "ku"tgs wktgf 0'Dcentikn"uqkul"kp"yj gug"ctgcu"uj qwrf "dg"engcp" ucpf { 'hkn'y kj "nguu"yj cp"34'r gtegpv'hkpgu"cu"qwrkpgf "kp"yj g"Uxtwewtcn"Hkn"ugevkqp"qh"yi ku"tgr qt 0'Uqkul"y kj " gr ctcvkqp"uj qwrf "dg"o ckpvckpgf "dgw ggp"yj g"dqwqo "qh"yj g"eqpetgvg"cpf "uqkul"y kj "gngxcvgf "hkpgu"*o qtg" yj cp"34'r gtegpv+0""



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Vj g"dcenhkni'uqku'f ktgev{"dgpgcyj"cp{"eqpetgvg"r cxgo gpv"tgs vktg"eqo r cevkqp"vq"; : "r gtegpv"qh"o qf kkgf" Rtqevqt"*CUVO 'F 3779+0'Vj g"uqki'uj qwf "dg"y kj kp"5"r gtegpv"qh"qr vlo wo "o qkuwtg"eqpvgpv"f vtkpi "y g" eqo r cevkqp0'Y g'tgeqo o gpf "wukpi "eqpetgvg"y kj 'c'o kpko wo "eqo r tguukxg"uvtgpi yj 'qh'5.222/r uk0O czko wo " eqpvtqn'lqkpv'ur cekpi "uj qwf "dg"34/hv'kp"yj gug"ctgcu0'Vj g"eqpetgvg"uj qwf "dg"cmy gf 'vq"ewtg"c'o kpko wo "qh" 9'f c{u'r tkqt 'vq"ki j v'eqpuvt wevkqp'vtchke"cpf "36'f c{u'hqt"j gcxkgt "eqpuvt wevkqp'vtchke0'Eqpetgvg"r cxgo gpv'cv" yj ku'ukg'uj qwf "dg"c'o kpko wo 'qh'8/kpej /yj kemkh'wugf 0'Y g'tgeqo o gpf 'yj g"eqpetgvg"dg'tgkphqtegf 'y kj 'tgdct" hqt"j gcx{/vtchke"eqpf kkqpu0'Vj g"tgdct"tgkphqtego gpv'uj qwf "dg"f guki pgf "d{"c"uvt wewtcn'gpi kpggt"chgt" tgxkgy kpi 'yj ku'i gqvgej pkech'tgr qtv0""

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EQPUVTWEVKQP 'TGNCVGF 'UGTXKEGU'

Y g'tgeqo o gpf "ý cv'ý g"eqpvtcevqt "tgvckp" **Korgt kcn**/q"r gthqto "eqpuvt wevkqp" o cvgt kcn/vguvu"cpf "qdugt xcvkqpu" qp"ý ku"r tqlgev0'Hlgnf "vguvu"cpf "qdugt xcvkqpu"kpenvf g"xgtkhecvkqp"qh"hqwpf cvkqp"uvdi tcf gu"d { "r gthqto kpi " s wcnkv{ "cuuvtcpeg"vguvu"qp"ý g"r ncego gpv"qh"eqo r cevgf "uvt wewtcn"hkn0'Y g"ecp"cnnq"r tqxkf g"eqpetgvg"vguvkpi " cpf " eqpuvt wevkqp" qdugt xcvkqp" ugt xkegu0' Vj g" i gqvgej plecn' gpi kpggtkpi " f guki p" f qgu" pqv" gpf " y kj " ý g" eqpuvt wevkqp" f qewo gpvu0' Vj g" f guki p" ku" cp" qpi qkpi " r tqeguu" ý tqwi j qw" eqpuvt wevkqp0' Dgecwug" qh" qwt" hco knkctkv{ "y kj " ý g"uksg"eqpf kkqpu"cpf "ý g"kpvgpv"qh"gpi kpggtkpi " f guki p." y g"ctg" o quv's wcnkhkgf "vq"cff tguu" r tqdrgo u'ý cv'o ki j v'ctkug"f wtkpi "eqpuvt wevkqp"kp"c"vko gn{"cpf" equv/ghgevkxg" o cppgt0'

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NKO KVCVKQP 'E QO O GP VU''

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I gpgt cn'

"

Vj ku'i gqygej pkecn'gpi kpggtkpi 'ugtxkegu'tgr qtvj cu'dggp'r tgr ctgf 'hqt'yj g''gzenvukxg'wug'qh'**Uncp'Gpi lpggtkpi '' I tqwr.'**hqt"yj g''f guki p''cpf "eqputtwevkqp''qh''yj g''r tqr qugf "**Y guwr ng'Tq{ cnTqqhpi ''/'Nc{f qy p'[ctf** "kp'' **Qnggej qdgg.'Hnqt kf c**.'cu'f guetkdgf 'j gtgkp.'kp'ceeqtf cpeg'y kyj 'i gpgtcm{ 'ceegr vgf 'i gqvgej pkecn'gpi kpggtkpi '' r tqegf vtg''cpf 'r tcevkeg'kp''yj g''uvcy''qh'Hnqtkf c0Kk'ku'pqv'kpvgpf gf 'hqt''cp{ ''qy gt''r vtr qug''cpf ''pq''qy gt''y cttcpv{ '' ku''gzr tguugf ''pqt''ko r nkgf 0'Vj g''i gqvgej pkecn''gzr nqtcvkqp''cpf ''tgr qtv'f gcn''qpn{ ''y kyj ''uqkn'| qpgu''cpf ''uvcvc'' mecvgf ''y kyj kp''yj g''ctgc''tgr tgugpvgf 'htqo ''y g''i tqwpf ''uvthceg''q''yj g''yto kpcvkqp''f gr yj ''qh'yj g''dqtkpi u0'''

I gqqi lechikgtcwtg'hqt''y ku'r ctv'qh'Hqtkf c'kpf kecvgu'y g'uqku'ctg'i gpgtcm{ 'wpf gtnckp'd{ 'ko guqpg'dgf tqem' y cv'ku'uwegr vkdng''q''f kuuqnwkqp''cpf 'uwdugs wgpv'f gxgnqr o gpv'qh'nœtuv'hgcwtgu'uwej ''cu'xqkf u''cpf ''ukpnj qngu'' kp''y g''pcwtch'uqki'qxgtdwtf gp0'Rtqr gtv{ 'f gxgnqr o gpv'kp''c''ukpnj qng''r tqpg''ctgc'ku''y gtghqtg''ceeqo r cpkgf ''d{ '' uqo g''tkun'y cv'kpvgtpch'uqki'gtqukqp''cpf ''i tqwpf ''uwdukf gpeg''eqwff ''chgev''uvtwewtgu''kp''y g''hwwtg0'Ki'ku''pqv'' geqpqo kecm{ 'hgcukdng''q''gzr nqtg''qt''q''f guki p''uvtwewtgu''cv'y ku''ukg''y kj ''c''i qcn''q''grko kpcvg''y g''r quukdktk{ '' qh''hwwtg''ukpnj qng/tgncvgf ''cevkxk{ ''cpf lqt''r tqdngo u0'Kp''cp{ ''gxgpv.''y g''Qy pgt''o wuv'wpf gtucpf ''cpf ''ceegr v'' y ku'' tkun0' C'' o qtg'' kp/f gr y '' kpxguvki cvkxg'' r tqi tco '' ku'' tgs vktgf '' q'' gzr nqtg''y g'' r qvgpvkcn' hqt'' ukpnj qng'' f gxgnqr o gpv=''gxgp''y gp.''r tqdcdktk{ ''htqo ''kpf kevqtu''ku''j ctf ''q''r tgf kev0'Xgt {''f ggr ''dqtkpi u''cpf ''i gqr j {'ukecn'' gzr nqtcvkqpu''ctg''v{r kecm{ 'tgs wktgf ''q''gzr nqtg''ukpnj qng''r qvgpvkcn0'Vj ku'v{r g''qh''gzr nqtcvkqp''ecp''dg''eqpf wevgf '' cv'y ku'ukg. ''cv'cp''cff kkqpcn'equv.'kh'f guktgf ''cpf ''tgs wguvgf ''kp''y tkkpi ''d{ ''y g''ntgr.''g''

Nko kwc wap 'qh'yj g'Ueqr g'qh'Ugt xkegu''

Vj ku'i gqvgej plecn "gzr matcvkqp" tgr qtv'j cu'dggp" r tgr ctgf "vq" ckf "kp" vj g"gxcnwcvkqp" qh'uqkn' cpf" i tqwpf y cvgt" eqpf kkqpu" cv'y g"r tqlgev'ukvg. "cpf" vq" cuuluv' vj g"enkgpv' cpf" vj gkt" f guki pgt" gpi kpggtu 0'Vj g"ueqr g"qh'ugtxkegu" ku" nko ksgf" vq" vj g" ur gekhe" r tqlgev' ukvg" mecvkqp" cpf" r tqlgev' cur gevu" cu" tgrcvgf" vq" vj g" uqkn' cpf" i tqwpf y cvgt"



eqpf kkqpu0'Y g"j cxg" wkkk gf "qwt"gzr gtkgpeg."uqwpf "lwf i go gpv."cpf "r tqxgp" uekgpvkhe"o gy qf u"kp" y g" f gxgqr o gpv'qh'qwt 'f cvc"cpcn{uku."eqpenvukqpu."cpf 'tgeqo o gpf cvkqpu'hqt "y ku"r tqlgev0'Cp{"eqpenvukqpu'qt" i'geqo o gpf cvkqpu'o cf g'd{"qy gtu'dcugf "qp"y g'f cvc"eqpvckpgf 'j gtgkp"ctg"pqv'y g'tgur qpukdkkkkgu'qh**Ko r gt kch**" wprguu'y g"ctg''i kxgp"y g"qr r qtwpkv{"vq"tgxkgy "cpf "eqpewt"y kj "y go 0'Y j kg"f wg"ectg"j cu'dggp"gzgtekugf 'kp" y g"r gthqto cpeg"qh'y gug"o gcuvtgo gpvu"cpf "qdugtxcvkqpu."cu"y gmicu"y gk" kpvgtr tgvckqp."y g"ecp"o cng"pq" tgr tgugpvcvkqpu."y cttcpvkgu."qt"i wctcpvggu"y kj "tgur gev'vq"ncvgpv'qt"eqpegcraf "eqpf kkqpu"y cv'o c{"gz kv." cpf lqt "y j kej "o c{"dg"dg{qpf 'y g"ho ku"qh'f gvgevkqp"y kj "y g'o gy qf qmi kgu"wugf 0'Y g"tgugtxg"y g"tki j v'q" gxcnvcvg"cp{"py 'kphqto cvkqp'j cv'dgeqo gu"cxckrcdng"vq"f gvgto kpg"y g'ho r cev'y g"pgy 'kphqto cvkqp0' "

Vj g"ueqr g"qh"qwt "ugt xlegu"f qgu"pqv"kpenxf g"cp{ "gpxktqpo gpv"cuuguuo gpvu"qt "gzr mtcvkqpu"hqt "y g"r quukdmg" r tgugpeg"qh'j c| ctf qwu"qt 'vqzke 'uwduvcpegu'kp 'y g"uqkn 'i tqwpf y cvgt."qt 'uwthceg'y cvgt 'y ky kp"qt 'kp 'y g'i gpgtcn' xlekpkx{ "qh'y g"ukvg"uwvf kgf 0°Cp{ "uvcvgo gpvu"o cf g"kp 'y ku"tgr qtv"qt "uj qy p"qp 'y g"vguv'dqtkpi "mi u"tgi ctf kpi " wpwuvvcn"uvduwthceg"eqpf kkqpu"cpf lqt "eqo r qukkqp."qf qt."uvckpkpi ."qtki kp."qt"qy gt "ej ctcevgtkukeu"qh"y g" uwthceg"cpf lqt "uvduwthceg"o cvgtkcmi"ctg"uvtkev{ "hqt"y g"kphqto cvkqp"qh"qwt "enkgpv"cpf "o c{"qt"o c{"pqv"dg" kpf kecvkxg"qh"cp"gpxktqpo gpvcn'r tqdngo 0'

Ej cpi gf 'Eqpf kkqpu''

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Vj g"cpcn{uku"cpf "tgeqo o gpf cvkqpu"uvdo kvgf "kp"yj ku"tgr qtv"ctg"dcugf "vr qp"yj g"f cvc"qdvckpgf "htqo "yj g"uqki" dqtkpi u"cpf "qyj gt "vguvi" gthqto gf "hqt"yj g"enkgpv"cv"yj g"necvkqpu"kpf kecvgf "qp"**Hk vt g"4"*Ukg'Rn p'y kj 'Vguv' Nqec vkqpu**+"cpf "htqo "cp{ "qyj gt "cxckrcdng"kphqto cvkqp"f kuewugf "kp"yj ku"tgr qtv"Vyj ku"tgr qtv"qpn{ "guvko cvgu" xctkcvkqpu"y j kej "o c{ "qeewt"dgw ggp"yj gug"vguv"dqtkpi u0"Kp"yj g"r gthqto cpeg"qh"uvduvthceg"gzr nqtcvkqp." ur gekhke "kphqto cvkqp"ku"qdvckpgf "cv"ur gekhke "necvkqpu"cv"r gekhke "ko gu0J qy gxgt."kvku"c"y gm/npqy p"hcev'yj cv" xctkcvkqpu"kp"uqki"cpf "tqeni'eqpf kkqpu"ecp"gzkuv"cv"cp{ "ukg"dgwy ggp"vguv'dqtkpi "necvkqpu"cpf "ko"ypzr nqtgf" ctgcu"qh"yj g"ukg0"Vj gug"xctkcvkqpu"ctg"f wg"vq"yj g"kpj gtgpv"xctkcdktks{ "qh"yj g"uvduvthceg"eqpf kkqpu"kp"yj ku" i gqmi ke"tgi kqp0Uj qwf "xctkcvkqpu"dgeqo g"cr r ctgpvif wtkpi "eqpuvt vevkqp."kv'y kn'dg"pgeguuct {"vq"tg/gxcnvcvg" qwt "eqpenvukqpu"cpf "tgeqo o gpf cvkqpu"dcugf "vr qp"qwt"qp/ukg"qdugtxcvkqpu"qh'y g"eqpf kkqpu"

Tgrtqfwevkqp''

Vj g"tgr tqf wevkqp"qh"vj ku"tgr qt v'qt"cp{"r ctv'j gtgqh "kp"r ncpu"qt"qvj gt"gpi kpggtkpi "f qewo gpvu"uwr r hgf "vq" r gtuqpu"qvj gt"vj cp"vj g"enkgpv'o wuv'dgct"vj g"ncpi wci g"kpf kecvkqp"vj cv'vj g"kphqto cvkqp"eqpvckpgf"j gtgkp"ku"hqt" i gpgtcn'kphqto cvkqp"qpn{"cpf "vj cv'vj g"enkgpv'cpf "vj ku"hkto "ctg"pqv'hcdng"vq"uwej "qvj gt"r gtuqpu0"

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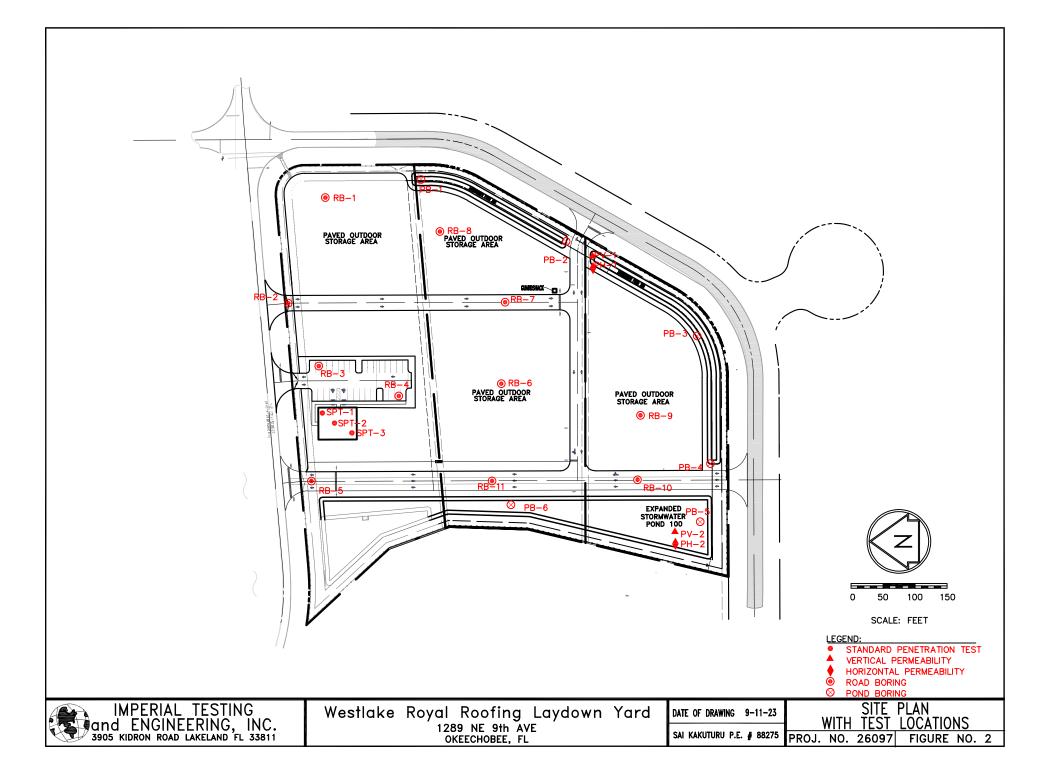
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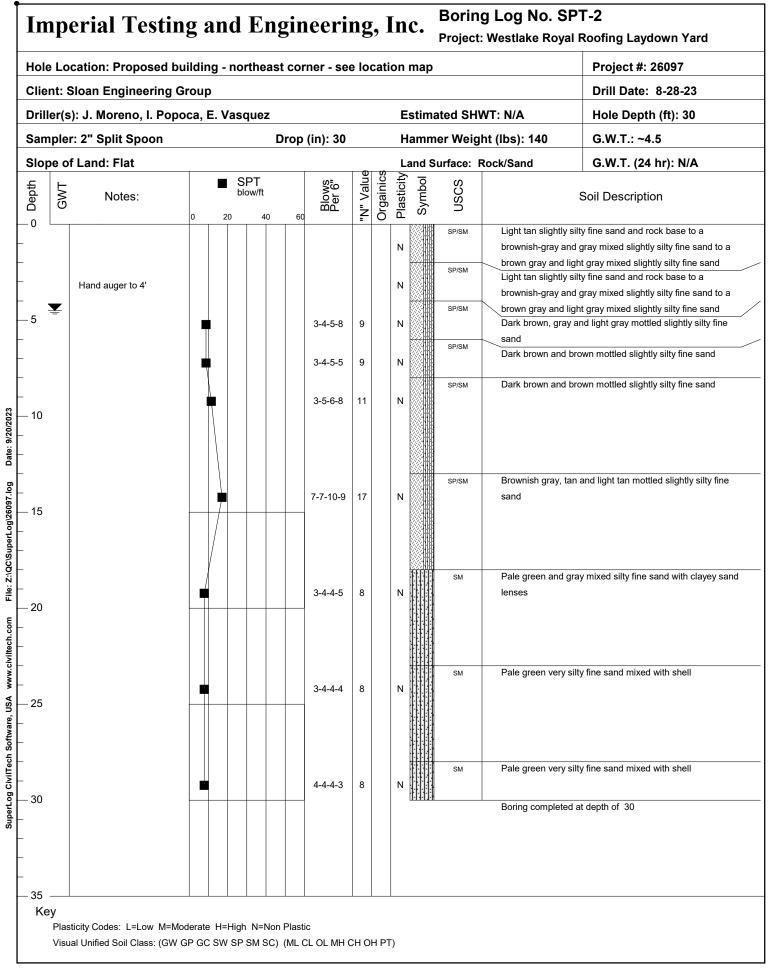


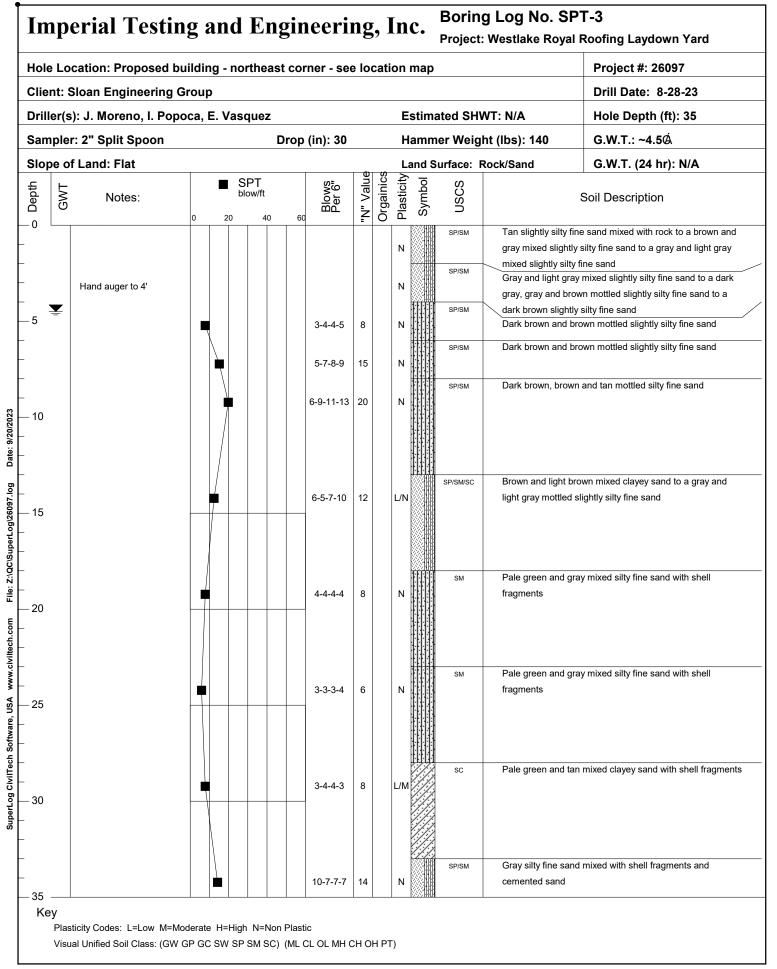


5 DD9 B8 +. 5 ·

6 CF=B; '@C; G'

Hole	e LocationKProposed b	uilding - northeast co	orner - see	ocation map	Á		Project #: 26097
Clie	nt: Sloan Engineering (Group					Drill Date: 8-28-23
Drill	ler(s): J. Moreno, I. Pop	oca, E. Vasquez		Estin	ated SHV	NT: N/A	Hole Depth (ft): 25
Sam	npler: 2" Split Spoon	Dro	op (in): 30	Hamr	ner Weigl	ht (Ibs): 140	G.W.T. ~4.5'
Slop	pe of Land: Flat			Land	Surface: F	Rock/Sand	G.W.T. (24 hr): N/A
o Depth	Notes:	 SPT blow/ft 20 40 	Blows Per 6"	"N" Value Orgainics Plasticity Symbol	nscs		Soil Description
- 0				N	SP/SM	Light tan slightly sil gray slightly silty fir	Ity fine sand and rock to a gray and light ne sand
	Hand auger to 4'			N	SP/SM		gray mixed slightly silty fine sand to a nixed slightly silty fine sand
5	▼		3-3-5-7	B N	SP/SM	Light tan slightly sil fine sand	lty fine sand to a dark brown slightly silty
			5-5-6-5	1 N	SP/SM	Orangish-brown sli	ghtly silty fine sand
- 10			4-5-6-8	1 N	SP/SM	Light brown and br	own mottled slightly silty fine sand
			7-7-3-4	о м	sc	Brown, tan and gra	ay mixed clayey sand
- 15							
- 20		-	3-2-2-3	4 N	SP/SM	Gray and light gray	r mottled slightly silty fine sand
~-			2-2-2-2	4 L	SM	Gray very silty fine	sand mixed with shell fragments
- 25					<u></u>	Boring completed a	at depth of 25
30							
35	 2y						





Hole	e Location: Proposed bu	uilding - northeast	corner - see	loca	tion	map			Project #: 26097
Clie	nt: Sloan Engineering G	Broup							Drill Date: 8-28-23
Drill	ler(s): J. Moreno, I. Pope	Hole Depth (ft): 10							
Sam	pler: 2" Split Spoon	D	rop (in): 30		F	lamm	er Weig	G.W.T.: ~5.3'	
Slop	pe of Land: Flat			<u>a) a</u>			urface: F	Rock/Shell	G.W.T. (24 hr): N/A
o Depth	Notes:	 SPT blow/ft 20 40 	Blows Per 6"	"N" Value	Plasticity	Symbol	NSCS	S	Soil Description
- 0					N		SP/SM		nents to a light tan slightly silty fine ight gray mixed slightly silty fine sand
	3" hand auger				N		SP/SM	Very light gray and t	an mixed slightly silty fine sand
5	¥		3-3-5-7	8	N		SP/SM	Brown, gray and ligh	nt gray mottled slightly silty fine sand
			8-8-7-7	15	N		SP/SM	Dark brown and bro	wn mottled slightly silty fine sand
			4-4-4-6	8	N		SP/SM	Dark brown and bro	wn mottled slightly silty fine sand
- 10								Boring completed at	depth of 10
15									
- 20									
- 25									
30									

	In	nperial Testing	g and Engi	neering		Boring Log No. RB- Project: Westlake Royal F	
	Hold	e Location: Proposed eas	t driver porth and	- soo location			Project #: 26097
		ent: Sloan Engineering Gro		- see location	ппар		Drill Date: 8-28-23
		ler(s): J. Moreno, I. Popoc			Estima	ted SHWT: N/A	Hole Depth (ft): 10
		npler: 2" Split Spoon	Dro		er Weight (lbs): 140	G.W.T.: ~4.6'	
		pe of Land: Flat		,p (iii). 00		urface: Rock/Shell	G.W.T. (24 hr): N/A
	Depth	H Notes:	SPT blow/ft	Blows Per 6" "N" Value		Ŋ	Soil Description
	— 0 - -				N	and light gray mixed	mixed slightly silty fine sand to a gray slightly silty fine sand to a light gray slightly silty fine sand
	_	Hand auger to 4'			N	SP/SM	slightly silty fine sand to a dark gray
	- 	Ţ		3-4-5-5 9	N	v	t tan mottled slightly silty fine sand
	_			5-6-7-7 13	N	SP/SM Dark brown and bro	wn mottled slightly silty fine sand
	_			7-6-7-8 13	N	SP/SM Brown mottled slight brown mottled slight	ly silty fine sand to a light brown and ly silty fine sand
1/20/2023	— 10 -					Boring completed at	depth of 10
Date: 2	-						
na/.iog	-						
JerLog/20	— 15 -	_					
z:/dc/supercog	_						
LIE	- 20	_		_			
liecn.com	_						
www.civii	_						
le, uoA	— 25 _						
	_						
	-						
BonnerLog	— 30 -						
	-						
	— 35 Ke						
		Plasticity Codes: L=Low M=Mode Visual Unified Soil Class: (GW GP	-		HPT)		

Ι	mp	oerial Testii	ng a	ano	d Er	ngir	neeri	ng	5,	I	nc.		ng Log No. RB t: Westlake Roval F	- 3 Roofing Laydown Yard
H _H	പപ	ocation: Proposed p	arkin	a arı	e east	of shi	nning of	fice	'n	٥r	theast	-	-	
		Sloan Engineering		-	5, 6051	01 511	pping vi	Ticc	,	0.	licust	Conner	- See location map	Drill Date: 8-28-23
		(s): J. Moreno, I. Pop			seunez						Fstima	ated SH	IWT: N/A	Hole Depth (ft): 10
		er: 2" Split Spoon		<u> </u>	10440-		(in): 30						ght (lbs): 140	G.W.T.: ~4.4'
		of Land: Flat				Бібр	(). 00					urface:		G.W.T. (24 hr): N/A
Depth	- LWO		0	20	SPT blow/ft	60	Blows Per 6"	"N" Value	Orgainics		Symbol	nscs		Soil Description
												SP/SM		sand mixed with rock and shell to a
-											N	CD/CM	light gray mixed slig	d slightly silty fine sand to a gray and htly silty fine sand
-		Hand auger to 4'									N	SP/SM	, ,	ixed slightly silty fine sand to a dark
-	Ţ											SP/SM		/ mixed slightly silty fine sand
-5							3-3-3-5	6			N		Dark brownish gray sand	and brown mottled slightly silty fine
							7-7-7-8	14			N	SP/SM		wn mottled slightly silty fine sand
-				IT I								SP/SM	Dark brown and bro	wn mottled slightly silty fine sand
	0						4-6-7-8	13			N			
													Boring completed at	depth of 10
5														
	5													
	•													
	0													
	0													
-														
-														
§ −2	:5													
nn − 3	0			\vdash										
5														
	5 —													
	Key Pla	asticity Codes: L=Low M=N	loderate	e H=⊦	liah N=Nı	on Plast	ic							
		sual Unified Soil Class: (GW			-			сн с)H P	PT)				

Boring Log No. RB-4 **Imperial Testing and Engineering, Inc.** Project: Westlake Royal Roofing Laydown Yard Hole Location: Proposed parking area, east of shipping office, southwest corner - see location mapProject #: 26097 Drill Date: 8-28-23 **Client: Sloan Engineering Group** Driller(s): J. Moreno, I. Popoca, E. Vasquez **Estimated SHWT: N/A** Hole Depth (ft): 10 Sampler: 2" Split Spoon Drop (in): 30 Hammer Weight (lbs): 140 G.W.T.: ~4.0' Slope of Land: Flat G.W.T. (24 hr): N/A Land Surface: Rock/Sand Plasticity Orgainics SPT "N" Value Symbol Blows Per 6" USCS Depth GWT blow/ft Notes: Soil Description 40 60 20 0 Tan and gray mixed slightly silty fine sand mixed with rock SP/SM and shell to a gray and light gray mixed slightly silty fine Ν sand to a light gray and light brown mixed slightly silty fine SP/SM sand Hand auger to 4' Ν Gray and light gray mottled slightly silty fine sand to a gray, V SP/SM light gray and light brown mottled slightly silty fine sand - 5 2-3-5-5 8 Ν Dark brown and brown mottled slightly silty fine sand SP/SM Dark brown and brown mottled slightly silty fine sand 3-4-4-7 8 Ν Brown and light brown slightly silty fine sand SP/SM 4-5-7-9 12 Ν Date: 9/20/2023 10 Boring completed at depth of 10 SuperLog CivilTech Software, USA www.civiltech.com File: Z:\QC\SuperLog\26097.log 15 - 20 25 30 35 Key Plasticity Codes: L=Low M=Moderate H=High N=Non Plastic Visual Unified Soil Class: (GW GP GC SW SP SM SC) (ML CL OL MH CH OH PT)

	Im	nperial Testin	ng an	d Er	ıgir	ieeri	ng	5,]	In	c.		ng Log No. RB	- 5 Roofing Laydown Yard
╞	Hole	e Location: Proposed pa	arking a	rea, wes	t driv	e road. r	ort	h er	nd ·	- see	locatio	n map	Project #: 26097
		nt: Sloan Engineering (-	-				Drill Date: 8-28-23
		ler(s): J. Moreno, I. Pop		/asquez					E	Estim	ated SH	IWT: N/A	Hole Depth (ft): 10
		pler: 2" Split Spoon	,	•		(in): 30						ght (lbs): 140	G.W.T.: ~4.2'
		be of Land: Flat				. /						Rock/Sand	G.W.T. (24 hr): N/A
	Depth	Notes:	0 2	SPT blow/ft	60	Blows Per 6"	"N" Value	Orgainics			NSCS		Soil Description
-	- 0								N		SP/SM	light gray slightly silt	sand and rock base to a gray and y fine sand to a light gray and
		Hand auger to 4'							N		SP/SM		d slightly silty fine sand light tan mottled slightly silty fine sand
-	-										SP/SM	_	in and gray mottled slightly silty fine
	- 5					2-3-3-3	6		N		57/510		ight gray mottled slightly silty fine sand wn mottled slightly silty fine sand
╞											SP/SM	Dark brown and bro	wn mottled slightly silty fine sand
F						2-3-4-4	7		N				
Ē	4.0					3-7-8-10	15		N		SP/SM	Dark brown and bro	wn mottled slightly silty fine sand
	- 10									10000rm	1	Boring completed a	depth of 10
F													
n –	- 15												
	- 20												
	- 25				_								
-													
s L	- 30												
	00												
° -													
╞													
╞	_												
╞	- 35 Ke	l				l	1	1	I				
	1.0	Plasticity Codes: L=Low M=Me	oderate H=	High N=N	on Plast	ic							
		Visual Unified Soil Class: (GW	GP GC SW	/ SP SM S0	C) (ML (CL OL MH (сн о	H P	Г)				

Hol	e Location: Proposed p	aved outdoor storage	area, approximat	e center - see location map	Project #: 26097
Clie	ent: Sloan Engineering (Group			Drill Date: 8-28-23
Dril	ller(s): J. Moreno, I. Pop	Hole Depth (ft): 10			
San	npler: 2" Split Spoon	Droj	o (in): 30 I	Hammer Weight (Ibs): 140	G.W.T.: ~3.7'
Slo	pe of Land: Flat			and Surface: Grass	G.W.T. (24 hr): N/A
Depth	H Motes:	■ SPT blow/ft 0 20 40 6	Blows Ber 6" "N" Value Orgainics	Symbol USCS	Soil Description
- 0			N	SP/SM Light brown silty fi	ne sand to a brown and tan mixed Ind to a brown and light tan mixed
	Hand auger to 4'		N	SP/SM	nd with light tan cemented sands to a gray mixed slightly silty fine sand
				Light gray, gray ar	d brownish-gray mixed slightly silty fine wnish-gray mixed slightly silty fine sand
- 5			3-4-4-3 8 N	Dark brown slight	rk brown mottled slightly silty fine sand / y silty fine sand
			3-4-6-9 10 N	Brownish-gray and	I very light tan mottled slightly silty fine
			7007 46 N	SP/SM Very light tan sligh	tly silty fine sand
- 10			7-8-8-7 16 N	Boring completed	at depth of 10
– 15					
20					
- 25					
- 30					
- 35					

	m	perial Testin	a and Fn	ainoorin	σΙ	ne	Borir	ng Log No. RB	-7
		iperiar resum		gintering	g, 1	пс.	Projec	t: Westlake Royal F	Roofing Laydown Yard
н	lole	Location: Proposed ea	ast drive road, so	uth end - see lo	ocatio	on map			Project #: 26097
c	lier	nt: Sloan Engineering G	iroup						Drill Date: 8-28-23
D	rille	er(s): J. Moreno, I. Popo	oca, E. Vasquez			Estim	ated SH	IWT: N/A	Hole Depth (ft): 10
s	am	pler: 2" Split Spoon		Drop (in): 30		Hamm	er Weig	ght (Ibs): 140	G.W.T.: ~3.5'
s	lop	e of Land: Flat			പം		urface:	Grass	G.W.T. (24 hr): N/A
Denth		Notes:	■ SPT blow/ft 0 20 40	Blows Per 6"	"N" value Orgainics	Plasticity Symbol	NSCS	Ş	Soil Description
	0 L					N	SP/SM		y mixed slightly silty fine sand to a ight brown mixed slightly silty fine
-						N	SM		and very light tan mixed slightly silty
╞		Hand auger to 4'				N	0	fine sand Dark brown and gra	y mixed silty fine sand to a brown silty
È.	5						SP/SM	fine sand to an oran	gish-brown silty fine sand
Ē	5			2-3-3-3 6	6	N			t brown mottled slightly silty fine sand
\vdash				3-4-5-6 9	9	N	SP/SM	Dark brown and ligr	t brown mottled slightly silty fine sand
				5-7-11-16 1	8	N	SM	Light brown and gra	y silty fine sand with clayey sand
	10							Boring completed a	depth of 10
5									
<u></u>									
9	15								
-2	20								
-									
5-2	25								
~	30								
F									
F									
+:	35 -								
	Key	y Plasticity Codes: L=Low M=Mo	oderate H=High N=No	n Plastic					
		Visual Unified Soil Class: (GW	-		OH PT)			

Ho	ole	Location: Proposed	paved	out	door st	orage	area bet	wee	en e	east driv	ve and p	oond - see location	mBipoject #: 26097
CI	ien	t: Sloan Engineering	Group	b									Drill Date: 8-28-23
Dr	ille	r(s): J. Moreno, I. Po	poca, l	E. V	asquez					Estim	ated SH	IWT: N/A	Hole Depth (ft): 10
Sa	mp	oler: 2" Split Spoon				Drop	o (in): 30			Hamr	ner Wei	ght (lbs): 140	G.W.T.: ~3.3'
SI	ope	e of Land: Flat							- 10	Land	Surface:	Grass	G.W.T. (24 hr): N/A
bepth		H Notes: O	0	2	SPT blow/ft	6	Blows Per 6"	"N" Value	Orgainics	Plasticity Symbol	NSCS		Soil Description
0 										N	SP/SM	to a dark gray and	light gray mixed slightly silty fine sand ight gray slightly silty fine sand to a very dark gray mottled slightly silty fine
	1	Hand auger to 4'								N	SP/SM	sand Dark gray mottled s	slightly silty fine sand to a brownish gray
_5							3-4-4-5	8		N	SM	mottled slightly silty	r fine sand to a brown and light brown r fine sand
╞							3-4-5-5	9		N	SM		own mottled silty fine sand
F							5-5-5-8	10		N	SM	Light brown silty fin	e sand
	0											Boring completed a	at depth of 10
L													
-	_												
1: 	5												
-													
- 2	n												
	0												
- 2	5												
-													
	n												
- 3	0												
-	F												
-3 	o – ≺ey	,			ii								

Hol	e Lo	cation: Proposed p	aved	out	door	stor	age	area, so	uth	ро	tio	n, ap	proxim	ate center - see loc	atiPrrojezqt #: 26097
		Sloan Engineering (•			-			-		Drill Date: 8-28-23
Dril	ler(s): J. Moreno, I. Pop	oca,	E. V	asqu	iez					Е	stim	ated SH	WT: N/A	Hole Depth (ft): 10
San	nplei	r: 2" Split Spoon				[Drop	(in): 30			н	amm	er Weig	ght (lbs): 140	G.W.T.: ~3.6'
		f Land: Flat					-						urface:		G.W.T. (24 hr): N/A
Depth	GWT	Notes:	0	2	SP ⁻ blow	T //ft 40	60	Blows Per 6"	"N" Value	Orgainics	Plasticity	Symbol	NSCS	5	Soil Description
0													SP/SM	-	slightly silty fine sand to a brown and
L											N			tan and gray slightly	ightly silty fine sand to a brown, light silty fine sand
F		Hand auger to 4'									N		SP/SM		mixed slightly silty fine sand to a very
F	Ŧ	Tiana adgor to T													an mottled slightly silty fine sand
-5								2-2-2-2	4		N		SP/SM	Dark gray and light	tan mottled slightly silty fine sand
-			T										SP/SM	Dark gray and light	tan mottled slightly silty fine sand
-								2-2-4-5	6		N				
				\sum									SM	Gray, light gray and	tan mottled silty fine sand
- 10								5-5-9-10	14		N				
F														Boring completed at	t depth of 10
-															
-															
-															
- 15															
F															
20															
L															
F															
F															
-															
- 25															
-															
-															
F															
- 25 - - - 30															
L															
F															
F															
- 35															
K	∋у														

Hole	e Location: Proposed v	vest drive road s	outh end - see	ocation ma	`		Project #: 26097
	nt: Sloan Engineering				,		Drill Date: 8-28-23
	er(s): J. Moreno, I. Pop			Fetin	nated SH	WT: N/A	Hole Depth (ft): 10
	pler: 2" Split Spoon	G.W.T.: ~4.0'					
			Drop (in): 30			ght (lbs): 140	
	be of Land: Flat	SPT	WE_		Surface:	Grass	G.W.T. (24 hr): N/A
, Depth	H S U Notes:	■ SPT blow/ft 0 20 40	Blows Per 6"	"N" Value Orgainics Plasticity Symbol	nscs		Soil Description
— 0 —				N	SP/SM		mixed slightly silty fine sand to a dark It gray mottled slightly silty fine sand
_					SP/SM		gray mottled slightly silty fine sand ht tan mottled slightly silty fine sand to a
	Hand auger to 4'			N		light tan, gray and c	lark gray mottled slightly silty fine sand
— 5			7-7-6-6	3 N	SP/SM	to a light tan slightly Tan and light gray r	/ silty fine sand nottled slightly silty fine sand
_					SM	Tan and light tan m	ottled silty fine sand
_			6-5-7-10	2 N	SM	Gray tan and light	tan mottled silty fine sand
-			6-7-10-12	7 N			
10 						Boring completed a	t depth of 10
_							
_							
- 							
-							
_							
_							
20							
_							
_							
_							
- 25							
_							
_							
_							
— 30			+				
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_							
— 35 — Ke							

I	In	ip	erial Testin	g a	nd	E	ngi	neeri	nę	5,]	In	c.		ng Log No. RB	-11 Roofing Laydown Yard
	Hole Location: Proposed west drive road, approximate center - see locatio														Project #: 26097
ł			Sloan Engineering G		IVEI	Jau, a		ap	Drill Date: 8-28-23						
ł					Vas				F	stim	ated SF	HWT: N/A	Hole Depth (ft): 10		
ł	Driller(s): J. Moreno, I. Popoca, E. Vasquez Sampler: 2" Split Spoon Drop (in): 30													ght (lbs): 140	G.W.T.: ~3.3'
ł		-	f Land: Flat				DIO	p (11). 00					Surface:		G.W.T. (24 hr): N/A
	Depth	GWT	Notes:	0	■ 8 20	SPT blow/ft 40		Blows Per 6"	"N" Value	Orgainics			Nace.		Soil Description
ł	- 0								-				SP/SM		ed slightly silty fine sand to a
	-										N			brownish-gray slight slightly silty fine san	ly silty fine sand to a light brown d
╞	-	¥	Hand auger to 4'								N		SP/SM	Light brown slightly	silty fine sand to a tan and light tan
╞	-	_											SP/SM	fine sand	ne sand to a brownish-gray slightly silty
ł	- 5							6-5-4-4	9		Ν			Brownish-gray sligh	ly silty fine sand
f	-												SP/SM		ly silty fine sand to a dark brown silty
	-							4-5-6-6	11		N			fine sand to a tan ar	id light tan mixed slightly silty fine sand
	-							5-5-6-6	11		N		SM	Tan and light gray n	nixed silty sand
	- 10													Boring completed a	depth of 10
	-														
	-														
<u></u>	-														
	- 15							_							
2	-														
	-														
	-														
	- 20														
	-														
	-														
	-														
	- 25							1							
	-														
	-														
	-														
2	- 30							_							
3	-														
Ī	-														
	-														
╞	- 35														
	Ke		ticity Codoo: 1 -1 cm M-M-M-	dorat-	U-L II -	b N-N		atio							
			ticity Codes: L=Low M=Moo al Unified Soil Class: (GW G		-				сн с)H P	T)				



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FTKNNGTU'HKGNF'TGRQTV

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ENK	₽V<'Unqc	p'Gpi kpg	gtkpi"Itqwr"		RTQLGE V'P WO DGT<' 482; 9" J QNG'P WO DGT<'		RD)/3	
					'Qnggej qdgg. 'HN'/'Y guvreng'Tq{en'Tqqhkpi 'Nc{fqyp'[etf				
					FCVG'EQO RNGVGF<' C wi wuv'4; .'4245				
					qpf "522."pqtyj "gpf "/ "ugg"nqecvkqp"o cr				
			wmqwij."E0"Ejkw{		NCP F 'UWTHCE G'V[RG<'' I tcuu				
					NCPF1FGI TGG<' Hrv			-	
					pf 'Cwi gt I'4\$'F RV				
					¢506)" CHVGT'46'J TU<' P IC				
					34)" GNGX CVIQP 'F KHHGT GPE G'*. 1/+				
DQI			ZI I OKVJ <						
Uco rıg'V{rg	Uco rng'Fgrvj '' Kjovgt xcri%pej gu+	Uco rııg'T geqxgt { ' *\$pej gu+	UER'Tgcf lpi u''' ≉F knll cwi g+	\$P\$'Xcnwg	Ucorıg'Fguetkrıklıp **pej go'cpf''qtfgt'qh'gcej'ocygtkın" *ucpf≓ènc{g{'ucpf≓iucpf{'ènc{≠ènc{+	Ricusiels:	Tqqvul'Qti cple"	WEUU o dqn	O qkuwt g'Eqpvgpv
J C	2/6				Dtqyp"cpf"itc{"okzgf"unkijvn{"uknv{"hkpg"ucpf	Р	///	URILO	F
J C	6/48				Nkij v'dtqy pkuj/itc{"unkij vn{"ukm{"hkpg"ucpf	Р	///	URILO	F
J C	48/65				Fctm/dtqyp/ukm//'ucpf	Р	///	"UO	ΟIU
J C	65/94				Dtqyp"unkijvn{"ukn/{"hkpg"ucpf	Р	///	URILO	U
F RV	94/; 5				Dtqyp"cpf"hkijv"dtqyp"okzgf"unkijvn{"hkpg"ucpf	Р	///	URILO	U
F RV	; 5/326				Nkij v'dtqy pkuj/itc{"enc{g{"ucpf	NIO	///	UE	U
F RV	326/366				Vcp"cpf "hki j v'\cp"o kzgf "unki j vn{ "ukn-{ "hkpg"ucpf	Р	///	URILO	U

Uto r ng"V{r g"Eqf gu&""RJ "? "RquvI qng=""J C"? "J cpf "Cwi gt=""UV? "Ur nk/"L qqp=""Wv? "U gnt{"Vvdg=""F RV"? "F kgev/Rwij "Vgej pqni { =""UE"? "Upke"Eqtg=""FE"? "F tknfEwwlpi u'CH? "Cwi gt"Hki j v' O qkuwtg"Eqpypt/Eqf gu&"F "? F t {=""O"? 'O qku=""Y "?"Y gy="U? "Ucwtcyf""Ruwlek{ {~N"? "Ngy "O ? 'O qf gtcg""J '? 'J k j "P "? P qp"Ruwle



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FTKNNGTU'HKGNF'TGRQTV

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ENKGP V<'Uqcp'Gpi kpggtkpi 'I tqwr "	RTQLGE V'P WO DGT<' 482; 9"	J QNG'P WO DGT <'	RD/4
RTQLGEV'NQECVKQP<' 34: ; 'P G'', y 'Cxg0'Qnggej qdgg	g."HN"/"Yguwncng"Tq{cn'Tqqhkpi"Nc{fqyp"[ct	f	
FCVG'UVCTVGF<' Cwi wuv'4: .''4245" FCVG'EQO	RNGVGF < <u>'</u> C wi wuv'4; .''4245		
J QNG'NQE CVKQP<' Rtqr qugf 'uvqto y cvgt'r qpf '522.'uq	wj "gpf "/"ugg"nqecvkqp"o cr		
F TKNNGT*U ≺' <u>F</u> 0O eEwmqwij.'E0Ej kw{"	NCPF'UWTHCEG'V[RG<' I tcuu		
GUVIO CVGF 'UJ Y O <' 4; \$" UNQRG'QH'NCP F 1F GI	TGG<' Hicv		
UCO RNGT'F ICO GVGT'CP F'V[RG~' 5\$"J cpf 'Cwi gt I'4	\$'F RV		
I TQWPFY CVGT'FGRVJ /'KO O GFKCVG<' ¢50)" CHVGT'46'J TUK'	РЮ	
DOT RPI 'VGTO RPCVKOP'FGRVJ<' 34)"	GNGXCVKOP 'F KHHGTGPEG'*-1/+		

Uco rıg'V{rg	Ucorıg'Fgryj" Kovgt xcıl%pej gu+	Uco rııg'Tgeqxgt{" *apej gu+	UER'Tgef họi ư'' *Flenll cwig+	\$P\$'Xcnvg	Ucorng'Fguetkrvkgp *kpej gu'cpf 'qtfgt 'qt/gcej 'ocygtkm'' *kcpf≓èm{g{'kcpf≓kcpf{'èm{≓èm{+	Ricudels/	Tqqvul'Qt i cple"	WLEU'U{ o dqn	O qkuvut g'Eqpvgpv
JС	2/9				Dtqyp'unkij vn{''ukn/{''hkpg''ucpf	Р	///	URILO	F
J C	9/33				Nkij v'dtqy p"cpf"dtqy p"okzgf"unkij vn("uknv{"hkpg"ucpf	Р	///	URILO	F
J C	33/3:				Dtqyp"cpf"itc{"okzgf"unkijvn{"uku{"kkpg"ucpf	Р	///	URILO	F
J C	3:/44				Dtqypkuj/itc{."dtqyp"cpf"nkijv"dtqyp"okzgf"unkijvn{"ukuv{"hkpg"ucpf	Р	///	URILO	F
J C	44/4;				Nkij v'dtqy p"cpf "vcp"o kzgf "unkij vn{ "ukuv{ "hkpg"ucpf	Р	///	URILO	F
J C	4; /72				Vcp"cpf "hki j v"vcp"o kzgf "unki j vn("ukm-{ "hkpg"ucpf	Р	///	URILO	F1U
J C	72/94				Nkij v'dtqy p''unkij vn{''ukun{''Hxpg''ucpf	Р	///	URILO	U
F RV	94/329				Nkij v'dtqy p''unkij vn{''ukm{''hkpg''ucpf	Р	///	URILO	U
F RV	329/337				Dtqy pkuj /i tc{"ukn{"ucpf	Р	///	UO	U
F RV	337/366				Nki j v'vcp''urki j vn(''ukrv{ 'hkpg''ucpf	Р	///	URILO	U

Ucorng"V{rg"Eqfgu<""RJ ?? "Rquv"J qng=""J C?? 'J cpf "Cwi gt=""U?" 'Ur n/u' qqp=""U"? 'U gnd{ "Vvdg=""F RV"? 'F kgev"Rwj "Vgej pqni { =""UE"? 'Uqple"Eqtg=""FE"? 'F tmiE wvbpi u'CH? 'Cwi gt"Hhi j v' O qkuwtg"Eqpvgpv"Eqfgu<"F ?? F t {="O"? 'O qku="Y ?? Y gu="U? 'Ucwtcgf """""""""Ruwlek{ <"N"? 'Ngy "O"? 'O qfgtcg"J ?! J k j "P ?? 'P qp"Rcuvle



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FTKNNGTU'HKGNF'TGRQTV

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ENKSPV<'Uqcp'Gpi kpggtkpi "I tqwr"	RTQLGE V'P WO DGT<'
RTQLGEV'NQECVKQP<'	guvenng"Tq{en'Tqqhhpi"Ne{fqyp"[etf
FCVG'UVCTVGF<' Cwi wuv'4: .'4245" FCVG'EQO RNGVGF	<' Cwi wuv'4; .''4245
J QNG'NQE CVKQP <' Rtqr qugf 'uxqto y cvgt 'r qpf '422. 'cr r tqzko cvg	g"egpygt"qhir qpf "/"ugg"nqecylqp"o cr
FTKNNGT*UK'F0OeEwmqwij.'E0Ejkw{"	NCP F 'UWTHCE G'V[RG<'' I tcuu
GUVKO CVGF 'UJ Y O <' 45\$" UNQRG'QH'NCP F 1F GI TGG<' H	Hrcv
UCO RNGT 'F KCO GVGT 'CP F 'V[RG<' _5\$'J cpf 'C wi gt I'4\$'F RV	
I TQWPFY CVGT'FGRVJ /'KO O GFKCVG<' ¢50)"	CHVGT'46'J TUK' P K
DQTHPI 'VGTO HP CVKQP 'F GRVJ <' 34)"	GNGXCVKQP 'F KHHGTGP EG'*. 1/K

Uco rıg'V{rg	Uco rıg'Fgryj " Işəvgt xcıl ^{ıs} ləpej gu+	Uco rıy'Tgeqxgt{" *\$pej gu+	UERTgef kpi u''' *F keril ewig+	\$P\$'Xcnvg	Աշօ r ıg'F guet kr vkgp *kpej gư≿pf 'կtf gt 'կh'gcej 'ծ c vgt kcտ'' *ucpf ≓ènշ { g{ 'ucpf =iucpf { 'ènշ { =ènշ { +	Ræ uvle kv{	Tqqvul'Qti cple"	WUEU'U{ o dqn	O qkuvvt g'Eqpvgpv
JС	2/7				Dtqyp"cpf"itc{"okzgf"unkijvn{"ukn/{"hkpg"ucpf	Р	///	URILO	F
J C	7/37				Fctmű tc{."ű tc{."dtqy p"cpf "nki j v"dtqy p"okzgf "unki j vn{"uknv{"hkpg"ucpf	Р	///	URILO	F
J C	37/45				Fctmlitc{"cpf"dtqypkuj/itc{"okzgf"unkijvn{"ukn{"hkpg"ucpf	Р	///	URILO	F
J C	45/56				Nkij√'dtqyp"cpf"nkij∨'dtqypkuj/itc{"okzgf"unkijvn{"uknv{"hkpg"ucpf	Р	///	URILO	F
J C	56/68				Vcp'hpg'ucpf	Р	///	""UR	F IY
J C	68/94				Dtqy pluj /i tc{"cpf "cp"o lzgf "uku{"ucpf	Р	///	UO	Y 1U
F RV	94/33;				Nkijv'itc{"uknv{"ucpf	Р	///	uo	U
F RV	33;/366				Nkij√\cp'\unkij vn{"ukn-{"hkpg'\ucpf	P	///	URIUO	U

J]gi Ư Ἰ b]Z]YX ʿCc] ˙ 7 ʿUgg. ʿÇÕ Y Ả̈́O ̈́Uૠ̃Õ Ôૠ̈́U Ả̈́U ̈́AŪŪẢĂŪT Ả̈́UÔĐૠ̈́Ţ ŠẢ̈́ĐŠẢĂU ŠẢ̈́T P Ả́Đ P Ả́U P Á́U P Á́U VD



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FTKNNGTU'HKGNF'TGRQTV

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ENKGP V<'Uqcp'Gpi kpggtkpi 'I tqwr''	RTQLGE V'P WO DGT<'
RTQLGE V'NQE CVKQP<' 34: ; 'P G'; yi 'Cxg0'Qnggej qdgg.'HN'/''Y g	guweng'Tq{en'Tqqhkpi'Ne{fqyp'[etf
FCVG'UVCTVGF<' Cwi wuv'4: .''4245" FCVG'EQO RNGVGF	<" C wi wuv'4; .'4245
J QNG'NQECVIQP<' Rtqr qugf "uqto y cvgt "r qpf "422." y guv gpf "/" u	gg"meexkqp"ocr
FTKNNGT*U+<'F0O eEwmqwij.'E0Ej kw{"	NCPF'UWTHCEG'V[RG<' I teun
GUVKO CVGF 'UJ Y O <' 57\$" UNQRG'QH'NCP F 1F GI TGG<' H	hrcv
UCO RNGT 'F KCO GVGT 'CP F 'V[RG<' _5\$"J cpf 'C wi gt I'4\$"F RV	
I TQWPFY CVGT'FGRVJ /'KO O GFKCVG<' ¢6(8)"	CHVGT'46'J TUK' P 1C
DQT IP I 'VGT O IP CVKQP 'F GRVJ <' 34)'	GNGXCVKQP 'F KHHGTGPEG'*. 1×

Uco rıg'V{rg	Ucorıg'Egryj" Kovgt xcıl"kpej gu+	Uco rıy'Tgeqxgt{" *\$pej gu+	UERTgef kpi u''' *F knll cwig+	\$P\$'Xenvg	Ucorrg'Fguetkrvkgp *pej gu'cpf 'qtfgt 'qt/gcej 'ocygtkm'' *ucpf≓èm{g{'ucpf≓ucpf{'èm{≓èm{+	Rıc ınkels{	Tqqvul'Qt i cple"	WUEU'U{ o dqn	O qkuvvt g'Eqpvgpv
JС	2/:				Nkij v'dtqy p'hkpg'ucpf	Р	///	UR	F
J C	:/35				Dtqy pkuj /i tc{'uuki j vu{'ukuv{ 'hkpg'ucpf	Р	///	URILO	F
J C	35/3;				Dtqyp"cpf"itc{"oqwngf"unkijvn{"kkny{"kkpg"ucpf	Р	///	URILO	F
J C	3;/4;				Fctmlitc{.'itc{kuj/dtqyp"cpf"nkijv"dtqyp"okzgf"unkijvn{"kknv{"kkpg"ucpf	Р	///	URILO	F
JС	4;/57				Nkij v'dtqy p"cpf "hkij v'dtqy pkuj/itc{"okzgf"unkij vn{"uknv{"hkpg"ucpf	Р	///	URILO	F
J C	57/69				Nki j v'vcp''urki j vn(''ukuv(''hkpg''ucpf	Р	///	URILO	FΙΟ
J C	69/94				Nkij v'dtqy p''unkij vn{''ukm{''hkpg''ucpf''y kyj''ktqp''urckpkpi	Р	///	URILO	ΟIU
F RV	94/; 9				Nkij v'dtqy p"cpf"vcp"o kzgf"unkij vn{"ukm{"hkpg"ucpf	Р	///	URILO	U
F RV	; 9/32;				Dtqy pkuj /i tc{''uku{''ucpf	Р	///	UO	U
F RV	32;/366				Dtqyp"cpf"itc{"okzgf"xgt{"ukuv{"vq"enc{g{"ucpf	NIO	///	UO IUE	U

Ucorng"V{rg"Eqfgu<""RJ ?? "Rquv"J qng=""J C?? 'J cpf "Cwi gt=""U?" 'Ur n/u' qqp=""U"? 'U gnd{ "Vvdg=""F RV"? 'F kgev"Rwj "Vgej pqni { =""UE"? 'Uqple"Eqtg=""FE"? 'F tmiE wvbpi u'CH? 'Cwi gt"Hhi j v' O qkuwtg"Eqpvgpv"Eqfgu<"F ?? F t {="O"? 'O qku="Y ?? Y gu="U? 'Ucwtcgf """""""""Ruwlek{ <"N"? 'Ngy "O"? 'O qfgtcg"J ?! J k j "P ?? 'P qp"Rcuvle



HJ€ÍÁSãã¦[}ÁÜ[zaáÁEÁŠaa:^|aa)åÉÁZŐÁHHÌFFÁEÁÍÎHÉÍIÏÉEÌÏÏÁEÁ2aa¢ÁÍÌHÉÍIÏÉFÏÏ€

FTKNNGTU'HKGNF'TGRQTV

Úæ*^ÁFÁ[-ÁF

ENKGP V<'Uncp'Gpi kpggtkpi 'I tqwr"	RTQLGE V'P WO DGT <' 482; 9" J QNG	"P WO DGT <' RD/7
RTQLGEV'NQECVKQP<' <u>34:</u> ; 'P G''; yj 'Cxg0'Qnggej qdgg.''HN'/''	"Yguvneng"Tq{cn"Tqqhkpi"Nc{fqyp"[ctf	
FCVG'UVCTVGF<' Cwi wuv'4: . "4245" FCVG'EQO RNGVO	GF <' C wi wuv'4; .''4245	
J QNG'NQE CVKQP<' Rtqr qugf 'uxqto y cvgt 'r qpf '322. 'uqwj "gpf	"/"ugg"nqecvkqp"ocr	
FTKNNGT*U⊷'F0O eEwmqwij."E0Ej kw{"	NCPF'UWTHCEG'V[RG<' I tcuu	
GUVKO CVGF 'UJ Y O <' 4; \$" UNQRG'QH'NCP F 1F GI TGG<	<' Hicv	
UCO RNGT 'F KCO GVGT 'CP F 'V[RG<' 5\$"J cpf 'C wi gt I'4\$"F RV		
I TQWPFY CVGT'FGRVJ /'KO O GFKCVG<' ¢6(6)'	CHVGT'46'J TU<'	PIC
DOTIPL 'VGTO PCVKOP'FGRVI $<''$ 34)'	GNGX CVKOP 'F KHHGT GP E G'*- 1/+<	

Uco rıg'V{rg	Ucorıg'Egryj" Kövgt xcıl"Apej gu+	Uco rıg'Tgeqxgt{' *Apej gu+	UER'Tgef lpi u''' *F knll ewig+	\$P\$'Xenvg	Ucorpg'Fguetkrvkgp *pejgu'cpf 'qtfgt 'qtigcej 'ocvgtkcm'' *ucpf≓ènc{g['icpf=icpf{'èn{≓ènc{+	Ricunkelay	Tqqvul'Qti cple"	WUEU'U{ o dqn	O qkuwt g'Eqpvgpv
JС	2/:				Itc{cpf"nkijvhtc{"okzgf"unkijvn{"hkpg'ucpf	Р	///	URILO	F
J C	:/39				Itc{"cpf"nkijv"dtqypkuj/itc{"okzgf"unkijvn{"hkpg"ucpf	Р	///	URILO	F
J C	39/46				Nki j v'dtqy p. "dtqy p."itc{"cpf" 'dtqy pkuj/itc{"okzgf" unki j vn{"ukuv{"hkpg" ucpf	Р	///	URILO	F
J C	46/4;				F ctmidtqy p"cpf "dtqy p"o kzgf "ukn{ "ucpf	Р	///	υο	0
J C	4;/94				Nkijv'dtqypkuj/itc{''unkijvn{''hkpg''ucpf	Р	///	URILO	U
F RV	94/: 8				Nkij v'dtqypkuj/itc{"unkijvn{"hkpg"ucpf	Р	///	URILO	U
F RV	: 8/328				Nkij v'dtqy p"cpf"itc{"okzgf"unkij vn{"ukuv{"hkpg"ucpf	Р	///	URILO	U
F RV	328/366				Dtqy p"cpf"itc{"okzgf"uku{"ucpf	Р	///	UO	U



HJ€ÍÁSãa![}ÁÜ[zaáÁzÁSæà^|za)áÉÁZÓSÁHHÌFFÁEÅÍÍHEÍIÏËBÌÏÏÁEÁZæ¢ÁÍÍHEÍIÏËFÏÏ€

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Úæ*^ÁFÁ,~ÁF

ENKSP V<'Uncp'Gpi kpggt kpi 'I tqwr "	RTQLGE V'P WO DGT < 482; 9" J QNG'P WO D	OGT<'RD/8
RTQLGEV'NQECVKQP<' 34: ; 'P G'; y 'Cxg0''Qnggej qdgg. 'HN''/ 'Y	guvncmg"Tq{cn'Tqqhkpi"Nc{fqyp"[ctf	
FCVG'UVCTVGF<' Cwi wuv'4: .''4245" FCVG'EQO RNGVGF	<" Cwi wuv'4; ."4245	
J QNG'NQE CVKQP <' Rtqr qugf "uqto y cvgt"r qpf "322."cr r tqzko cv	g"egpvgt"/"ugg"mecvkqp"o cr	
FTKNNGT*U⊷'F0O eEwnqwij.'E0Ej kw{"	NCPF 'UWTHCEG'V[RG<' I tcuu	
GUVKO CVGF 'UJ Y O <' 39\$" UNQRG'QH'NCP F 1F GI TGG<']	Hiev	
UCO RNGT 'F KCO GVGT 'CP F 'V[RG<' 5\$"J cpf 'Cwi gt I'4\$"F RV		
I TQWPFY CVGT'FGRVJ /'KO O GFKCVG<' ¢504)'	CHVGT'46'J TUK'	РЮ
DQTIPI 'VGTO IP CVKQP 'F GRVJ <' 34)'	GNGXCVKQP'FKHHGTGPEG'*-1/+<	

Uco rıg'V{rg	Uco rıg'Fgryj " Kövgt xcıl"Apej gu+	Uco rııg'Tgeqxgt{' *lpej gu+	UERTgef lpi u''' *F knll cwig+	\$P\$'Xenvg	Ucorng'Fguetkrvkqp *kpejgu'öpf'ktfgt'qhlgcej'öcvgtkun≝'' *kopf≓ènc{g{'kopf=kopf{'ènc{=}	Ræunde lø{	Tqqvul'Qti cple"	WUEU'U{ o dqn	O qkuvut g'Eqpvgpv
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J C	7/34				Fctm/dtqyp"cpf"hkijv'dtqyp"okzzgf"unkijvn{"hkpg"ucpf	Р	///	URILO	F
J C	34/39				Dtqypkuj/itc{"cpf"hkijv'dtqyp"oqwngf"unkijvn{"hkpg"ucpf	Р	///	URILO	F
J C	39/45				Nkijv'dtqyp''unkijvn{''hkpg''ucpf	Р	///	URILO	FIO
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F RV	94/: 3				Vcp"cpf"dtqyp"okzgf"unkijvn{"hkpg"ucpf	Р	///	URILO	U
F RV	: 3/; 7				Nkij v'dtqy p"cpf"itc{"okzgf"unkij vn{"uknv{"hkpg"ucpf	Р	///	URILO	U
F RV	; 7/366				Vcp"cpf"hkijv'itc{"okzgf"ukna{"ucpf	Р	///	UD	U

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I G85!BF7G'GC=@GI FJ9M'F9DCFH'



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OEÁ,¦[åĭ&oA,í,~Ás@∘Á⊳æsaã,}æ Ô[[]^¦ææãç^ÂÙ[ãÂÙ`¦ç^^Ê æÅn jā oÁ ~[¦oÁ, Ás@ ÁV, ãc å Ùæet • ÆÖ^] æid (^} oÁ, ~ æ*^}&@^•Á\$j&|`åāj*Ás@^ OE" ¦ã&č |č ¦æ‡ÁÔ¢] ^¦ã[^}c Ù cæcaji } • Ézer) å Á [& æ] ස්කීඩ් ස් ල

7 i ghca 'Gc] `F Ygci f WY' F Ydcfhi2cf C_YYW cVYY 7 ci bhž: `cf]XU



Df YZJWY

Ù [ā¦Á * ¦ç^ • Á\${] ; cæāj Á\$j - { ! { ææāj } Ás@æerÁse-^ & & or Áæj å Á • ^ Á, |æj }āj * Á\$j Á * ¦ç ^ Áse-^ æe ÉÅ V@ ^ Á@at @At [ā]Áfāj ãazeaāj } • Ás@æerÁse-^ & & or Áæj å Á • ^ • Ásej å Á ! [çãā^ Á\$j - { ! { ææāj } Å æà [* óA@ A, ! [] ^ ¦cã • Áj -Ás@ Á [ā]• Á\$j Ás@ Á * ¦ç^ ^ Áse-^ æe ÊÅÙ[ājÁ * ¦ç^ • Áse-^ Æå } * åÅ{ ! Å æà [* óA@ A, ! [] ^ ¦cã • Áj -Ás@ Á [ā]• Á\$j Ás@ Á * ¦ç^ ^ Áse-^ æe ÊÅÙ[ājÁ * ¦ç^ • Áse-^ Æå] * åÅ { æj ^ Ásã-^ ! ^ or • (* EÅs) & að * Áæ} { ^! • ÉÅsaj & @ ! • ÉÅ[! ^ • or ! • ÉÅse-* i } * å { æj ^ Ásã-^ ! ^ jæ á / -æSæand• ÊA} * å] * Áæ} { ^! • ÉÅsaj & @ ! • ÉÅ{ ! ^ • or ! • ÉÅse-* i } [} [{ ã or ÉÅ ! à að i] æj } ^! • ÉÅs[{ { * } ã ôr Áj -æSæand• ÊA} * ā] ^ ! • ÉÅsaj & @ ! • ÉÅsi } aå * ! • ÉÅsi à å A @ { Asi * ^ ! • ÈÅ QE • [ÊÆs[} • ^ ! çææāj } ã or É& æ&@ ! • ÉA č å ^ } or É&saj à Á] ^ & & anda or Á\$j Á ^ & . * asaātj } ÉÅ æ or Á åã] [• ædÉ&saj à Á, [] * Čã } Ás[} d [] Ásæð Á • ^ Ás@ Á * ! ç^ * • Á\$t Á@]] Ás@ { Á } ! • cæð à ÊÅ] !! or & CÉÅ ! Á } @æð & ^ Ás@ Á * ; cã [} { ~ } cā]] * [* & CÉÁ ! Á *] @æð & ^ Ás@ Á* ; cā [] { ~ } čä

Xælātǐ • ÁæjåÁ • ^Á^* ï |æaāti} • Át Ád?å^! ælÉAU cæc*ÉæsjåÁ [&æd4*[ç^!; { ^} or Át ælÁsti][• ^Á •] ^&&aad4^• el &&cati} • Át; } ÁæjåÅ • ^ At ! ÁæjåÅk!^æat ^} of Át El & At ! c^^ • Æst ^} of At ! a el Át][• ^ Á] ![] ^ ! cat• Ásc@exÁse^ Át • ^ å/Ásj Át ælāj * Ásælāti * e ÁæjåÅ * ^ At ! ÁæjåÅk!^æat ^} cati Åt ! a f A] ![] ^ ! cat• Ásc@exÁse^ Át • ^ å/Ásj Át ælāj * Ásælāti * e ÁæjåÅ * ^ At ! ÁæjåÅk!^æat ^} of At ! A el & A

Õ¦^ææ%aā~^!^}&^•ÆjÆ[į]^!cāt•ÁsæġÆ(šææ)Æk&æ;kýāc@ajÆ@;k%aā;æaj&^•EÅU[{^A[jā+Áse^A •^æe[}æa|^Á,^oÆj;ká`àb*&oÆjÆ[[å];*EÅU[{^Áse^A&[[K]+cæa]|^Æj*ææ]^Æj[[k]^A`ä*å&jÆ -{`}åææa]}Æj;ká`jåå];*•Æj;ká[æå+EÅO[æ^^A,j]{^^A[ja+Áse^A][[k]^A`ä*å&jK •^]ca&Aæa]\Ásea+[i]ca]}Æatjå+EÅOEÆ@#@Ajæe*!Áseaa]^Æjæ&A*[jaAj[[k]^A`ä*å&jÁ àæe^{^}o#jæ4kijå+ki]`}a#j*•æaajææa]}*È

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a) åÁ, @!^Áse]] [35æsi]^ÉA^¢ÉA ¢ÉA ætātazeļÁ œzē • ÉAzet[ājāteÁ œzē • ÉA æta]} ætÁ[:å]ā Æst ^ É&sār æsiajāt ÉA
•^¢`ætÁ[:a] @asata] *ÉA^} ^ œzEAs[:4] ! { æstā] > ÉA[:1] ätātazeļÁ œzē • ÉAzet[ājāteÁ œzē • ÉA] ætA] ! ætA œzē • ÉA
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V@Á[ā•ÁæjåÁ;ã&\||æ)^[`•Áæ^æÁ]á&æÁ`;c^^Áæ<æá,&&`;kj,ÁæjÁa;i^a^|;å^|;Å,Aœc}} ãÁ^|æc^åÁ[Á@A^[[]*^Êjæjå-{;ke^æA} & Áse^æÁ]á=æ^ÊsejåA;æc`iækj^*~œeā]}Á;Aœc`; æ^æÉDæ&@AjåÅ;A^[i]*^Êjæjå-{;ke^æA} & Ase^ÊsejåA;æc`iækj^*~œeā]}Á;Aœc`; æ^æÉDæ&@AjåÅ;A^[ājAsjåA] & Ase^A]æj^[`•ÁæA} & Ase^EsejåA;æc`iækj^*~œeā] [-Áæjå-{;ke^æA} & Ase^A} & Ase^A} & Ase^A]æjå-{;ke^æ} [Aégjå-{;ke^A} & Ase^A} & Ase

Ô[{ { [} | ÊBş åãçãå ǎæļÁ [āʰÁ; Ás@ Áæ) å•&æ] ^Á; ^!*^Áş q[Á; }^Áse] [o@ ¦Áse Ás@ ālÁ &@estæ&c^¦ãrcãk-Á'¦æå ǎæļ^Ás@est**ĚV[ÁS[}•d čok ést Ásæv Á[āA; æ] ÊÂQ , ^c^¦ÊA[āÁ •&ā) æiorÁ; čok á^c+{ a ^ k@ Ás[`} åætā*•Ás^c, ^^}Ás@ Á[ā+ÈZ/@ ^ Ásæ) Á; à•^¦ç^Á; }|^Á æ4jã ãv åA, ` { à^!A; -Á[āA; ![-ā]^•ÉD>^c, 'c@ |^••Êbc@•^A; à•^¦çæa‡; }•ÊA`]] |^{ { } c ^ a à Ásej Á } å^\ecet å] * Á; -Ás@ Á[ā‡Ċ,** cæa‡; } Ëæ) å•&æ] ^Á^|æa‡; • @] Êbse^A; ~æ&a) o A; c^\ã^A; \a&ada; }•Á; -Ás@ Áā; å•A; -Á[āJá; Áse) Áse) Áse} æse] àA; Aša c*!{ ā ^ As@ Ás[`} a æda) o A; c^\ã^A; \a&ada; }•Á; -Ás@ Áā; å•A; A[Já] Áse; Áse) Áse} æse] àA; Aša c*!{ ā ^ As@ Ás[`} a æda) •È

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V@Á[ā¼, æŋ Á^&æŋ }Ág &] áŋ &] áŋ &] á^• ᜠÁ[ā¼, æŋ Á[¦áœ /áŋ ^ā /ákæ /æŋ /ág c' · • dấæ 4ã oấ · Á •[ā¼, æŋ Á] ão Á; }ᜠÁ; æŋ Áæ) á A ¢ c · } c Á; Á æ& @á; æŋ Á }ãdấæ 9 å A & æd (* ¦æ] @ãk Á ^{ a[|• Á åã] |æ ^ å ¼; A œ Á; æŋ É @E • [¼; · • · } c å Áæ / Áç æð ñ · • Å; ^ cæð æææ Áæ [* læ] @ãk Á ^ { a[|• Á åã] |æ ^ å ¼; A œ Á; æŋ É @E • [¼; · • · } c å Áæ / Áç æð ñ · • Å; ^ cæð æææ Áæ [č vå æææ (* · * å Áξ Á] ¦[å * & / Áœ Á; æŋ É æŋ å Áæ å · • & lā] cũ ; / ¼ - A æ& @Á [ã¼; æŋ Á }ãE



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A 5 1 5 (۲// c Z-b) // γghíf C-4. C E^asá, -Áy c ^ · • oá (C E / C C c] g C c] g C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (Å f c a) Á V, ár Á (] * 0 C () (A (A ()) () * 0 + 1) C () () () () () () () C () () () () () () () () () (⊇ Ù][āļÁŒE∧æ D Ù(ţ}^ÂÙ][c M X^\:ÂÛ(t}^ÂÙ][c	$V@\dot{A}[\ddot{a}\dot{A}^{*}]c^{\Lambda^{*}} \cdot \dot{A}ceeds[{]!\ddot{a}^{\Lambda}\dot{A}[^{*}]\dot{A}CEUQ, \Lambda!\Lambda\dot{A}[a]]\Lambda^{a}\dot{A}se\dot{A}$ FKG $\dot{E}EEEE$ $Y ad) \ddot{a}^{*} h\dot{A}U[\ddot{a}\dot{A}T ad) \dot{A} se\dot{A}[\dot{a}\dot{A}[\dot{a}\dot{A}]]\ddot{a}^{*} \dot{A}sed \dot{A} sed \Lambda \dot{E}$ $\dot{O}] ad^{*} \Lambda {} \alpha\dot{A}[\dot{a}\dot{A}] ad \dot{A} se\dot{A}[\dot{a}\dot{A}][\dot{a}\dot{A}] \dot{A} sed \dot{A} sed \Lambda \dot{E}$ $\dot{O}] ad^{*} \Lambda {} \alpha\dot{A}[\dot{a}\dot{A}] ad \dot{A} sed \dot{A}[\dot{a}\dot{A}][\dot{a}\dot{A}] \dot{A} sed \dot{A} sed \Lambda \dot{E}$ $\dot{O}] ad^{*} \Lambda {} \alpha\dot{A}[\dot{a}\dot{A}] ad \dot{A} sed \dot{A}[\dot{a}\dot{A}] \dot{A} sed \dot{A} sed \dot{A} \dot{A} sed \dot{A}] \ddot{a}^{*} \dot{A} sed \dot{A} sed$		
ũ 12 0.¦æç∧∥^ÂÙ][c		Y^^àAÛ[āAÛ' ¦Ç^^ÁNÜŠKÁ Ô[[¦âājæe^ÂÛ' • cv{ ká Y ^àÁT ^ ¦&æe[¦ÁÇÒÚÙŐK+ÌÍÏ D T æ]•Á¦[{Ác@ÁY ^àÂÛ[āÂÛ' ¦Ç^^ Áse^ Ásæe ^åÁ;}Åc@ÁY ^àÁT ^ ¦&æe[¦/] ¦[b*&cā]}Éý, @3&@Aj, !^•^\;Ç^• Ásā^&cā]}ÁsejåÁ @ea] ^Ási ofsā d; lo Á åār ca) &^ÁsejåÁse ^adeĂCEAj, ![b*&cā]}Ás@eoAj, !^•^\;Ç^•Áse^ AdeĂ * &@áse Ác@A OEjà^!•Á* * adEze ^adeX[}3&Aj, ![b*&cā]}Év @? åAshÁ * ^âAseA ([!^Á æ&&* ¦æe^Áseq&* æeā]} •Á, -Ásār ca) &^Á; !Áse^ ades ^ A * ^âAš W@arÁ];[å* &ofsa Á*A]		
 Ú^\!^}}ã#¢Á′æe^\ Ü[&\ÁUče&\[] → Ùa¢jā^ÂU][c Ùa¢jā^ÂU][c ⇒ Ù^cç^\?^[ÂÛ\[ă^āÂU][c 	c	[-Ák@ÖÁç^∖•a[}}ÁsæerĞ9DÁjáercváÁsá^ [,È Ù[ājÁÙ';ç^^ÁOEA-æbÁ U\^^&@[à^^ÁÔ[`}ĉÉá2 [¦ãáæ Ù`;ç^^ÁOE^æbÖæææbÁ X^¦•a[}ÁOEEÂÙ^]ÆFÉAOEGG Ù[ājÁ[æ]Á}ãø Áse^Ájæå^ ^åÁÇaøÁr]æ&∿Áseh[,•DÁ{¦Á[æ]Á&æ¢^•Á FK(eBEEEA[¦Áæs*^¦È		
انم) (دوب ا∧ ایقف∧ ام ¦ انگار ش از مُنگان [c		Öæz∿ÇiDáver¦andyka[æt/∿-Á,∿[^4]@[([*¦æ]]@ åkká Ræ)ÁFÌÉXOEGG Ræ)Á HEÉXOEGG V@ Á¦o@[]@[([Á¦Á;c@];Áaæs^Á;æ]Á]}Á;@a&B@Ax@ Á[ājÁa]^•Á,^!^Á &[{]ā/àÁæ)àÁa∄ātā ^åÁ;[àæa]^Áaā~!•Á![{Á@ Aaæas**![~}}åÁ ā[æt^:^Áaā]]æô^åÁ;[àæ4ā?*atā*]*Á:æðà•Á;æð}aA*•č[({^Á@ Aaæas**![~}}åÁ ā[æt^:^Áaā]]æô^åÁ;}Á;@e^A;æðà•Á;æðà•Á;æðà•Á*;çãa^}cÈ		

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Ì	Ú∄, ^åæEÚ∄, ^åæEÁ, ^dÉÁã, ^Áæ), åÉÁ €Á⊈, ÁCÁ, ^¦& } ởÅ [[] ^•	ΗÐ	HJĔÃ		
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AUd'I b]h@/[YbX

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V@A(æ]Á}ão-A≦A|ā}^æes^åA(}}As@As^cæa#*åA([ā)A(æ]+AsjAseA[ā)A(`;ç^^AA];^•^}oAs@A •[ā]•A(`;Á(ã*&^||æ)^[`•Áse^~æ>AsjAs@A`;ç^^Ase^~æeEv@A(`æ]A`}ãAs^•&;ā]cā[}•Ése#[}*Á ¸ã@As@A(`æ]•É5&æ)As^A`•^åA([As^c*;{ā]^As@As[{][•ãa]}}æ]åA;å]åA;[]^;cā)•A(;AseA)

 $\begin{array}{l} CE_{A}(ad_{A}^{A}) & \tilde{a} \delta \delta \delta A^{A} & \tilde{a} \delta \delta A^{A} & \tilde{a} \delta A^{A} & \tilde$

V@Á;¦^•^}&^Á;áj[¦Á&[{][}^}œÁjÁæák;a)A^{3aAjA}[Á;æêÁ&a]ā,a] `•^~`|}^••Á;¦Áæ&&`¦æ&^Á;ÁœA&aææÈV@Á;àb^&aãç^Á;Á[á]]]]*ÁæÁ[cÁ[A&a]a^æe^Á]`¦^Áææ[][{ 38A&|æ•^•Á&`cÁææ@¦Á{(Á^]æeæ^ÁœÁæ}å•&æ]^Á§(a]a*a*A] |æ)å{|{ Á^*{ ^} @ Ás@æxÁ@æç^Áā[āædÁ•^Áæ)åÁ(æ)æ*^{ ^} d^^` ã^{ ^} @ ÉV@Á å^|ā]^æaā]}Á(-Á`&@Á^*{ ^} @ Á;}Á@Á(æ)Á,|[çãâ^•Á`~ã&ð}oÁ5]-{|{ æaā]}Á{|Ás@Á å^ç^|[]{ ^}o∱,-Á^•[`|&^Á]æ)•ÉGA55;c?}•ã;^Á•^Á{-A{ æ|Ásd^æ/Åæ;Å;a}}^åÉQ;_^c^!ÉÁ [}•ãc^Á5;ç^•c3tæaā]}Á5;Á^^å^åÁ6[Ás^-ā]^Ása)åÁ[&æc^Ás@Á[ā+Ása)åÁ(ā*&^||æ)^[`•Á æ^æÈ

OB; Á58a^}cāĉāj*Á^{ à[|Á,¦^&^å^•Ás@Á;aa); Á}ãoA;aa; ^ÁbjÁs@Á;aa); Á}ãoÁs@á[àá];•ÈÁ Òæ&@Ás^•&¦a]cā;}Ábj&|čå^•Á*^}^¦æ‡Áæ&orÁsæà[čoÁs@Á;ãoÁse);åÁ*ãç^•Ábj][¦cæ);oÁ[ājÁ]¦[]^¦cā*•Áse);åÁčăæfãa?•È

Ù[ā]•Ás@æcÁ@æç∧Áj¦[-ā]<+Ás@æcÁsek ^/ásek[[●c∕ásekā ^Á; æà ^Á]Ásek*[ā)4^(A*)ĖČÒ¢&^]cÁ[¦Á åã--^\^}&<>4§jÁs^¢č`¦^Áj-Ás@éÁ`¦-æss^Áæî^¦ÉŠsek|Ás@éA[[ā]•Áj-ÁseÁ ^¦ã?•Á@æç^Áj;æb[¦Á @[¦ã[]●Ás@æcÁsek^Árã;ājæs/ÁsjÁs{[{][●ãŭ]}Ešs@a3k}}^•●ÉŠseajåÁsek]æ)*^{ ^}ĊÈ

Ù[静,Á,Á}^Á^/a^/a^/a^/á} Á823 Á83-~/á9,Á*¢č /^Á,Á@Á~/a82^Á23 ^/á84/[]^ÉA(}3,0~*ÉA • 2433 ã°É\$\$*^*/^^Á,Á*/[•ā]}É\$#3 åÁ;c@'/&@2#282*/?ärGB+A@2#A2->&oAs@3A(*^ÉA)}Á@Á à 28:ã Á,Á* &@\$\$3-~/^} &^*É\$#4[ā/4^/a*/a*/ā*/á8;ā3:a^å/49;d *A*[ā/4,@2*-*ÉA[•A],A@Asd^2*A • @_}}Á;A@As^2*A[ā/4,a]*A*[ā/4,a]*As/3;&A;[ā/4^/a**EA/@2*-*ÉA[ā/4,@2*-*ÉA] • @_}}Á;A@As^2*AA/[ā/4,a]*As/3;&A;[ā/4^/a**EA/@2*-* &[{ { [}^Á];å3&2***AsA/a*;A^/a**;A/A@2*As/A@2*-^{A/A};A;A;a}*A *ā/A;a* ÉA(A/**A);A*}A*[]^*É\$#AsA,@2*A,A@2*A;A*@ACH]@2*A*A;A*A *ā/A;a* ÉA(A/**A);A*]A*[]^*É\$#AsA,@2*A,A*@ACH]@2*A*}

Ù[{^Á; æ]; Á}ão-Áæ^Á; æå^Á]Á; Áç [Á;¦Á; [¦^Á; æb;¦Á;[ā)-Á; áã &^||æ)^[`•Áæ^æÈÁ V@•^Á; æ]; Á}ão-Áæ;^Á&[{]|^¢^•Êæ••[&ãæeā;]•Ê4;¦Á}åã-^!^}cãæe^åA;![`]•È

CE&&{{]|^¢A&{}}êaronA,A&; [A;¦A;[¦^A[ā+A;karaka,a*A]aa)^[`•Aad^azeAa;A;A`&@AadyA;A;d&azeA]æec^¦}A;¦A;A;A`&@A{ad|Aad^azeAc@exA@^A&aa}}[oAa^A@_}}A^]aaze^^[`A;}Ac@A;aa}eEA V@A;æec^\}AadyA;[][¦ca]}A;A~Ac@A[ā+A;karaka,a*A]aa}[oAa^A]aaze^AA[{^_@exA}a]aadA ā}Aad|Aad^azeEACE]@edEO^caaA&[{]|^¢EEA(AA)A^\&^}oA{[]^•EEAA}

CE, Áæ• • [&ãææā]} Áā Á, æå^Á] Á, Áç [Á, ¦Á, [¦^Á^[*¦æ];@38æ4|^ Áæ• • [&ãææ^å Á, [ā• Á, !Á {ã&\||æ)^[`• Ásel-^æ Á;@æxÁse^^A @, } Åæ Á, } ÅÅ? ãx Á; Å@ Á, æ] • EÁO^&æě • ^ Á, Á, !^• ^} óA [!Áæj:c38æ];æz^å Á • ^• Á, Ás@ Á, æ] Á }ãv Áş Ás@ Á `!ç^^ Ásel-æÉžeÁ; æ Á, [óKs[} • ãa^!^å Å]!æsc38æ4Á, !Á, ^&^• • æ^ Áξ Á, æ] Á @ Á [ā• Á, !Á, ã &^||æ)^[`• Ásel-æ Á^] æ æA; |^ ÈÁ/@ Á]:æsc38æ4Á, !Á, ^&^• • æ^ Áξ Á, æ] Ás@ Á [ā• Á, !Á, ã &^||æ)^[`• Ásel-æ Á^] æ æA; |^ ÈÁ/@ Á]:æsc38æ4Á, !Á, @æá/@æá; Á, !]]['cā] } Á, Ás@ Á [ā• Á, !Á, ã &^||æ)^[`• Ásel-∞ Ásel-^æ Ásel-^A]:æsc38æ4Á, !Á, @æá/@æá; Á, !]]['cā] } Á; Ás@ Á [ā• Á, !Á; ã &^||æ] ^[`• Ásel-^æ Ásel-^A]:æsc38æ4Á, !A, @æá/@æá; Å; !]]['cā] } Á; Ás@ Á [ā• Á, !Á; ã &^||æ] ^[`• Ásel-^æ Ásel-^A] @æá/@á]; āædÉÁOE]; @æÉO^cæáse•[&ãææá]; ÈÉeÁ; ÁcA, ^!&^}; œA]] ^• ÉŹ# Ásel A^; ¢æ]]/^È

CE, Á'} ảã-^/^} coāve^ả A':[`] Asa Á, coả^Á] Á, Asg [Á, !Á, [!^A Á] ā+Á, !Á, ã & ||aa)^[`•Ásb-^ave Á co@wo/&[`|å/&i^A, cob]]^å/Ag åãçãa` coh^Ási óksb^Á, cob]]^å/&ve Á, }^Á } ão&i^A & ad ĝ c^!]!^ccenta]} •Á&cob} Asa^Á, cob ~Asa} áA, cob ad [.^kc@A[ā+Á]!{Á, ã & ||aa)^[`•Ásb-^ave Ág Ása4, cob]]^å/&ve A} & cob A}, [cá] } Á [.^kc@A[ā+Á]!{Á, ã & ||aa)^[`•Ásb-^ave Ág Ása4, cob]]^å/&ve A}, [cá] } Á [.^kc@A[ā+Á]!{Á, át}]^A, Át -As@A, cob A} & Asa[]^å/&ve A}, [cá] } [.áksb-^ade&A] A [.áksb-^ade&A] A [.áksb-^ade&A] A [.áksb-^ade]] A & Asa2, ad A} & Asa2, ad A} [] A & Asa4 A & Asa2, ad A} & Asa2, ad A} & Asa2, ad A} [] A & Asa4 A & Asa2, ad A} & Asa

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& 6 Ug]b[Yf'Z]bY'gUbXž\$'hc'&'dYfWYbhig`cdYg

AUd'I b]hGYHjb[

Þæaā[}æþ⁄(;æj,Á'}ãoÁ^{ { à[|k4(⊙•ç^{ Ò|^çæaā[}}k4(∈A\$(Á≂€€Á^^c T^æ)Åæj}`æþ⁄(a]ãæaā[}k4(GÁ\$(Â HÁ\$)&@• T^æ)Åæj}`æþ⁄aāðáe /2 /^kaĉi`A (A HÁ\$)&@• Ø*[[•dЁ;/^^/,A]^;a]ák4(Hí€Á\$(Á+Î Í Á\$a≈ê• Øæ{{ |æ)åÅ¢|æ•ãã&æaā[}k4(Øæ{{ |æ}åÅ(-Á`}ã`^Á\$[][;\œa)&^

AUdʻI b]hi7 ca dcg]hjcb

Óæði *^¦Áæ) å Áði áði áði Áfi áði kÌ €Á,^¦&^}c Tðj[¦Á&[{][}^}o KO€Á,^¦&^}c Ò•cáj æe^•Áæ'^Ásiæ•^å Aj Aj à•^¦çæaji}•É&a^•&¦ðj cáj}•Éæ) å Áslæ) •^&o Aj -Ás@Aj æji`}ãÈ

8 YgW]dh]cb`cZ6 Ug]b[Yf

GYHjb[

Šæ)å-{ ¦{ KÖ|ænijæt^, æê•Á} }Á, æðij^Ár∿!¦æ&^•É4¦ææ^Á} }Á, æðij^Ár*!¦æ&^• Šæ)å-{ ¦{ Á][•ãnāj} ÁÇc@^^Éāði[^}•ði]}æ¢DKV!^æåÉååði] Ö[, }E=[[]^Á @eði^KŠðj^æÉ&[]ç^¢ OE&![••É=[[]^Á @eði^KÔ[}&æç^ÉAði^æði Úæ^}oÁ;ær*¦ãæ4KÙæðiå^Á;æðij^Ås^][•ãne

Hmd]WU[·]dfcZ]`Y

OE Á E (Á Á 543) & @ • KÁ 33 ^ Á 23) å Ò* Á E Ó AFÌ Á 33 & @ • KÁ 33 ^ Á 23) å Ó @ D Á E FÌ Á 1 Á 33 & @ • KÁ 33 ^ Á 23) å Ô* Á E HÎ Á 1 Á € Á 33 & @ • KÁ 33 ^ Á 23) å

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Ü [] ^ K ∈ Áţ ÁCĂ ^ ¦&^}c Ü [] ^ K ∈ Áţ ÁCĂ ^ ¦&^}c Ö^] c @Áţ Á^• c đã cãç^ Á^ æč ' ^ K T [¦ ^ Ás@æ} Å € Áş & @ • Ö'aāj æč ^ Á\$ /æ • K Ú [[¦] Ás læ] ^ å Ü ` } [~ A\$ /æ • K Á Þ ^ * | ∄ ãa | ^ Ô æj æšač Á Á & @ Á [• c Á ậ ãāj * Á æĉ ^ / Áţ Á ! æ) • { ão ∮ æč / ÁÇS • æ D N P ∄ @Áţ Áç^ \ ^ Á @ å @Áţ È Í Á c [Á T J È] Áş E@ D Ö^] c @Áţ Á æc / Á æà | ^ K D [] ~ Ö ~] c @Áţ Á æc / Á æà | ^ K D [] ~ Ø / ^ ` ^ } & Â Á - Á [[å ĝ * K D [] ~ Ø / ^ ` ^ } & Â Á - Á [] å ĝ * K D | ^ ~ C ~ T æz â ` { Á æd ĵ ãc K D [] • æd] ^ Át Áç ^ | ĉ A | ã @ f Á æd] ^ Áç È E Áţ Á E E Á Û [å ã { Áæt • [/] cã } Á ææ i É Á æd î Č Aş & @ • K Š [] Á @ a [` á A È Áş & @ • D Û [å ã { Áæt • [/]] | Ê É Áţ Â € Áş & @ • K Š [] Á @ a [` á È Áş & @ • D

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Šæj å/&æj æå ääč Ák|æ• é ä&ææi j } Áä l å æk å DAAÞ[} ^Á] ^&ãa à Šæj å/&æj æå ääč Ák|æ• é ä&ææi j } Áŷ [} ål å æk å DAAÞ] P^å![|[* & AÚ[äµÖ![č] HAOBÖ Ø[/æ* ^ Á č äæà ääč Á*![č] HAUæ) å ^ Á[ä• Á; } Á|ææ Á, -Á, ^• & Å, LÁ@ å å & Á[] æj å• Á ÇÕFI I Ý ÓFI FØŠD U c@ / Áç^ * ^ ææiç^ Ák|æ• é ä&ææi j } HAU[[č * @ÁÇÜFI I ÝŸ €FFØŠDÊAUæ) å ^ Á[ä• Á; } Á|ææ Á, -Á { ^• & A [Å@ å å & Á[] æj å• ÁçÕFI I Ý ÓFI FØŠD P ^ å / & Æi [ä4áææi * HAŸ ^•

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Ú^¦&^}ơ{(, 4(, æ) Á}ãưÂ Á,^¦&^}c

Šæ)å{{{ KÖ¦æjæt^, æ`•Á;}Á;ædj^Áe^!!æe^•É!æe,[[å•Á;}Á;ædj^Áe^!!æe^•

Šæ)å-{'{ /{ /i [•ātā]} AÇ@^^Ëaā[^}•ā] æ DKV!^æåÊ&a]Êkæ}~

Ö[,}Ë=[[]^Ai@eaj^Kšāj^æi

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Uc@;/ký^*^œæçõ^Á&|æ••ã&Bæeqā}}KÙ[čc@ÁØ[[¦ãåæÁØ]æç;[[å•ÁÇÜFÍÍÝŸ€€HØŠDÊÂÙæ)å^Á •[ā•Á;}Á|ææ•Á;-Á;^•a&Á;¦Á@å¦&A([,]æ)å•ÁÇÕFÍÍÝÓFIFØŠD P^å¦&BÁ[jáÁææā]*KAÞ]

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Ü^/&^}ơţi-A; æjA`}ãk IA;^\&^}c Šæjå-{!{ KØ|æç [[å•Á;}A; æj3^ko*\!æ&^• Šæjå-{!{ A[[•ã#]}A;@^^Eā#] *#DKÜ#~\Ê&æ O[, }E=[[]^A:@j^KŠ3^æ O&{[••E=[]]^A:@j^KŠ3^æ Uc@!&;^*^Ͼ;^A&|æ•ã&æ#]}KÙ[`c@kØ[¦ãaækØ|æç [[å•ÁçÜFÍÍÝŸ€€HØŠDÂQ)æ;å^Á •[ā+Á;}A|æe:A;-A; ^•ã&A;!Á@å¦ã&A[,]æ}å•ÁçÕFÍÍÝÓFIFØŠD P^å/&&A[ā/áæ#]*KAÞ]

D`UVIX

Ú^/&^}ơf, Á; æj Á }ãt (Á,^!&^}c Šæ) å-{ !{ KÖ|ænij æ*^, æ*• Á;} Á; æð ja ^ Ác^!!æ&^* Ébå^] !^** áj } Á; æð ja ^ Ác^!!æ&^* Šæ) å-{ !{ Aj[*ãt j] * Á; @#j ^ KÔ[} & æç,^ OB; [*= E [[] ^ A @#j ^ KÔ[} & æç,^ UC@ ! Áç^* ^ æaaç ^ Ák]æ* ëã8æa ji } KØ!^* @; æc^! ÁT æ** @** Ásij å ÁÚ[} å* ÁÇÜFÍÍÝŸ€F€ØŠDÉA Ùæj å ^ Á[ā* Á;} Á d^æt Ác^!!æ&^* Ék[[å Á;|ænij* Ét i ýŸ€F€ØŠDÉA ÇÕFÍÍÝOFIÍØŠD P^å !&&A[āAænij* KÁŸ^*

Dca dUbc

Ú^/&^}o4, -4, a‡, Á}ãk 1, Á, ^¦&^}c Šaa)å-{/{KÖ|aa‡, ač•A,}Á, adā ^Ác^!!aa&^•Ê4jaae•A,}Á, adā ^Ác^!!aa&^• Šaa)å-{/{KÖ|aa‡, ača;}A, GQ^^Eaā{ ^}•ã} adDKV!^aa±Ê5±ā] Ö[,}E=[[]^A, @a‡^KŠā}^aa CB;[••Ē=[[]^A, @a‡^KÔ[}&aaç^Ê4ā}^a Uc@!/&ç^*^aaaaç^Ak jae•ãa3aaa‡}KÙ|[`*@AQÜFÍÍÝŸ€FFØŠDÉAÙaa)å^Á[ā+A,}Ájaae•A, Á {^•38A, ¦Á@å!38A[, jaa)å•ÁQÕFÍÍÝÓFIFØŠD P^å]a&A/[āAaaaā*KAŸ^•

5 bŴchY

Ú^¦&^} qấ - Ấ - æġ Á } ãt KF Á, ^¦&^} c Šæj å - ƒ ¦ { KÖ^] ¦^••ā } × Á; } Á; æb ĝ ^ Ác^!!æ&^• Šæj å - ƒ ¦ { Å [•ãā] } Áç@^^ Ëa ĵ ~ ¢ f } æb KV!^ æb Ëbb ä Ö[, } Ë |[] ^ Á @ej ^ KČ] ç^ ¢ Ébb] } &æç^ @b' [•• Ë |[] ^ Á @ej ^ KČ ġ ^ æb Ebb] } &æç @b' [•• Ë |[] ^ Á @ej ^ KČ ġ ^ æb Ebb] } &æç Uc@ ¦ Áç^ * ^ cæ āc ^ kb |æ• õ ãt 3 æt f k] } & d c a { Ác^!! æ&^• Êbb [[å Á, |æ] • Êb, ! Ág Á å^] ¦^•• ā] • ÁçÕ F Í Í Ý Ó F I Í ØŠ D P ^ å ! & A [āf Áæē j * KÚ?/•

: ƳXU

Ô`•{{ ÂÛ[ậÂÜ^•[`\&^ÂÜ^][\c

Šæ)å-{¦{ Á,[•ãā;}Á,©@^^Ëa?(^}•ã; A}•ã;}ædDKV¦^æåÉkæ)-É&å] Ö[,}Ë|[]^Á:@ej^KŠ3j^æ Ø&/[••Ē|[]^Á:@ej^KŠ3j^æÉ&[}&æç^ Uc@¦Aç^*^œæãç^Á&|æ•ã&ææ‡;}KÙ|[`*@AÇÜFÍÍÝŸ€FFØŠDÊÅÙæ)å^Á;ç^¦Á[æ{^Á[ậ•Á [}Á|ææ•Á;-Á@å¦&&A;[Á,^•&&A[],|æ)å•ÁçÕFÍÍÝÓGIFØŠD P^å¦&&A[ĵÁææ3j*KÁŸ^•

*Ì AUbUhYY``cUamZjbY`gUbXžZfYeiYbh`midcbXYXž\$`hc`%dYfWYbhig`cdYg

AUd'I b]hGYHjb[

Þæaāj}æļ⁄(;æj,Á;ão/á^{ à [/k4⊙+{ Í J Ò/^çæaāj} / k4€k4[ÁFI€Á^^c T^æ)/ka9}`æļ⁄aj/;/^&ajñaæaāj} /k41 Î Á4[Â H45]&@• T^æ)/ka9}`æµÁsada/k^{]^/æči/^k41 Î Á4[H45]&@• Øæj/a6]`æµÁsada/k^{]^/æči/^k41 Î Á4[H45]&@• Øæj{ |æ):å/k4|æ••ãæaæaāj} /k4Øæd{ |æ):å/k4-Á }ã`^Á54][¦œe)&^

AUdʻI b]h7 ca dcg]h]cb

Tæ)æe^^Áa)åÁá[āþæ/Á[āþ•KÌÍÁ]^\&^}c Tā][¦Á&[{][}^}o•KFÍÁ]^\&^}c Ò∙cā[æe^•Áa⁄á\æo^å/{}/{{à•^/çæaā]}•Êå^•&¦ā]cā[}•Êæ)åÁ\æ)•^&o-A(-Ác@A(æ)*)ãÈ

8 YgW]dh]cb`cZAUbUhYY

GYHjb[

Šæ)å-{/{ KÖ¦ænjæ*^, æ*•Á¦}Á,ædja,^Áev¦¦æ&A*•Ébå^]¦^**•áj}*Á;}Á,ædja,^Áev¦¦æ&A* Šæ)å-{/{ Á[•ánj}}Á©@^^Éaā[^}*4]}æDKV¦^æåÊbå3j Ö[,}E=[[]^Á:@ej^KÔ[}ç^¢ÉAja,^ædÊ&[}&æç^ O&{[**E=[[]^A:@ej^KŠāj,^ædÊ&[}&æç^ Úæ^}oA;æev¦ædyKUæ)å,^ÁedjaÅ[[æ]a*Aja,^ÁbÅ][*ãn+

Hmd]WU[·]dfcZ]Y

CHÁÉ Á; ÁFÌ Á\$ &@•KÁ|[æ; ^Áā]^Áæ)å Óc*ÁŻFÌ Á; ÁĤ Á\$ &@•KÁ-ā]^Áæ)å^Á|[æ; ÓÔ*ÁŻÁÌ Á; Á Í Á\$ &@•KÁ-ā]^Áæ)å^Á[æ; Ô*ÁŻÁÌ Á; Á €Á\$ &@•KÁ-ā]^Áæ)å^Á[æ;

DfcdYfh]Yg'UbX'ei U']h]Yg

Ù [[] ^ K € Áţ Áţ Á, ^ i & } c Ö'] c Ø áţ Á ^ • d & cağ, Á ^ æc ' / KT [| ^ Ás@e) Á € Áş & @ • Ö' æj æ * ^ Ás æ • K × ^ i Å [[| | ^ Ás i æ å , å Ü' } [- - Æ k æ • K × ^ i Å a å] ^ Ô æj æ & a č Á i - Á @ Á [[• c A á að * Á æ ^ i Á f Á ! æ) • { ã A j æ * ! Á S • æ D KT [å ^ ! æ ^ | ^ Á @ t Ø kţ Á @ t Ø kt ÇET I Áţ Á E D i Áş Đ D D Ö^] c Ø áţ Á æ * ! Á e æ i / K D [] ^ Ø / ^ ` ^ } & ^ A î - Á [[å] * KD [] ^ Ø / ^ ` ^ } & ^ A î - Á [] å] * KD [] ^ Ø / ^ ` ^ } & ^ A î - Á [] å] * KD [] ^ Ø / ^ ` ^ } & Â Â i - Á [] å] * KD / ` ` ^ } c Ô æ 8 ã { Á e æ i [] æ E Ê { æ e â ` { Å [] C } c A [Å e ^] C } c A [Å e ^] A [Å e] A e] A i A i A e] A i A i A i A e] A i A e] Qēçænājæà/^Ą́æe^¦Aŕĭ]]/^Êd€A[A΀A5]&@●kAT[å^¦æe^ÁQæà[ĭOÂÈJÁ5]&@●D

=bhYfdfYh]jY"[fcidg

Šæj å/kæj æbiðar kk/æ• áðaæn j / kal a ær å Dkkl>[}^Á]^8að å
Šæj å /kæj æbiðar kk/æ• áðaæn j / kal a ær å Dkkl>[}^Á]^8að å
Šæj å /kæj æbiðar kk/æ• áðaæn j / kal a ær å Dkkl>
P^å![[[* ða Al [ða b a da æ b a b kk] æ ^ Á k a ær å Dkkl>
P^å![[[* ða Al [ða b a da æ b a b kk] æ ^ Á k a ær å Dkkl>
P^å![[[* ða Al [ða b a da æ b a b kk] æ ^ Á k a æ b a b kk] æ ^ Á [ða h a æ b a b kk] æ ^ Á k a æ b a b kk] æ ^ Á k a æ b a b kk] æ ^ Á k a æ b a b kk] æ ^ Á k a æ b a b kk] æ b a kk] æ ^ Á k a æ b a b kk] æ b a kkk] æ b a kk] æ b a kk] æ b a kk] æ b a kk] æ b a

A]bcf^{*}7 ca dcbYbhg

:`cf]XUbU

¹ Ú^¦&^}ơfţ,-ÁţaajÁ}ãtÁİÁ,^¦&^}c Šaa)å-{;{KÖ^];^••āţ}•Áţ}Áţadā,^Ác`;!aa&^• Šaa)å-{;{A,[•āaţ}}ÁÇ@^^Eaξa^}ea O[__}Em[]^Aá@aj^KÔ[}&aa; OE&/[••Em[]]^Aá@aj^KÔ[}&aa; OE&/[••Em[]]^Aá@aj^KÔ[}&aa; Uc@;/Áç^*^aaaaāç^Á&;ae•ãa3aaaāţ}}KO!^•@;aac^;!ÁTad•@•Áaa)åÁÚ[}å•ÁÇÜFÍÍÝŸ€F€ØŠDĚA Ùaa)å^Áţç^;!Á[aaţ^Á[ā+Áţ}Ád^aaţÁc^;!:aa&^•EÅ[[åAţ|aaā]•Eáţ;!Á§Aå^];^••āţ}•Á ÇÕFÍÍÝÓGIÍØŠD P^å;!&A{[āAaaaā]*KAŸ^•

DUf_kccXž`cUamZjbY'gUbX

Ú^/&^}ơţi-Á; æj Á}ãtAl Á,^\&^}c Šæ)å-{ :{{KO|æærÁ;}Á; æj3; ^Ác`!!æ&^• Šæ)å-{ :{{KO|æærÁ;}Á; æj3; ^Ác@^^Ëai{^} •ãj} æDKV!^æåÊåi3] Ö[, }Ë=[[]^Á@ej^KŠ3;^æ O&:[••Ē=[[]^Á@ej^KŠ3;^æ Uc@:/Áç^*^œæiç^Ák/æ••ãææiji}KY^dæ)åÁPæåå, [[åÁPæi{{[&\ÁÇÜFÍÍÝŸ€FGØŠDÂ Š[æi{^kæjåAk]æ^^Â[ā•Á;}Á|æ•Á; Á@å]æÅá; A@å]æÅá;!Á; ^•æAí[, |æ)å•ÁçÕFÍÍÝOH FØŠD P^å!æAí[ājÁææij*KÁŸ^•

K]bXYf

Ú^¦&^}o4(́~4(́æ]Á′}ã0KHÁ)^¦&^}c

Šæ)å-{¦{ KÖ¦æājæ*^, æê∙Á;}Á; æb∄^Áe∿¦¦æ&^•Ê4∤ææ•Á;}Á; æb∄^Áe∿¦¦æ&^•

Šæ);å-{;{ /{ /i [•ã#];}A¢;;@^^Ëa?[^}•ã];æ/DKV¦^æåÉåå];Ékæ)~

Ö[, }Ë=∥[]^Á;@e#j^KŠāj^æHÉ&[}ç^¢

Œ&¦[••Ē=|[]^Á;@e];^KŠ3;^æÉ&[}&æ;^

Uc@;/Áç^*^œœçAka¦æ•áã&æçá]}KY ^dæjåÁPæåå, [[åAPæá { [& Á¢ÜFÍÍÝŸ€FQ2ŠDÉÁ Ù|[`*@Á¢ÜFÍÍÝŸ€FF2ČŠDÉÔæààæ*^ÁÚæ;{ Á¢]æç, [[å•Á¢ÜFÍÍÝŸ€€ÍØŠDÉŠ[æ; Â æ)åÁ&¦æ^^Á[ā+Á;}Á|ææ•Á; Á@å¦&A;¦Á; ^•&&A[], |æ)å•ÁçÕFÍÍÝÓHIF2ČSD P^å¦&&Á[āÁææ]*/ÁŸ^•

D`UVIX

Ú^/&^}ơţ Á; ađ Á }ãtKHÁ,^!&^}c Šaðjå-{;{KÖ|adājæ*, æ°•Á;}Á; adāj^Ár:!!ad&^•Éda^]!^••āj}•Á;}Á; adāj^Ár:!!ad&^• Šaðjå-{;{Á,[°ādāj}AÇ@^^Eādā_^}•áj}adDKV!^ada Êdaāj Õ[, }Ë|[]^Á;@dj^KÔ[}&adç^ OE:[*0=Ë|[]^Á;@dj^KÔ[}&adç^ UC@;!Á;^*^aadāj^KQ|ae•ãaBadaāj}KO!^•@; adc^!ÁTad=@•ÁdajåÁÚ[}å•ÁÇÜFÍÍÝŸ€F€ØŠDĚÁ Ùaðjå^Á[ā+Á;}Ád^ad; Ár:!!ad&^•Ê4{[[åÅ;|adāj•Ê4;]KAjÅa^]!^••āj}=Á ÇÕFÍÍÝÓFIÍØŠD P^å;!38Á[ākÁada]*KAŸ^•

, Ì D]bYXU!D]bYXUžkYhžZ]bY`gUbXž\$`hc`&`dYfWYbhg`cdYg

AUd'I b]hGYhhjb[

Þæaā[}æþ⁄(;æj,Á'}ãoÁ^{ { à[|k4(⊙•ç^]] Ò|^çæaā[}}k4(∈A\$(Á≂€€Á^^c T^æ)Åæj}`æþ⁄aī/;/^&ā]ãaæaā[}k4(GÁ\$(Â HÁ\$)&@• T^æ)Åæj}`æþ⁄aēāká^{]^;æč;/^k4(Î Ì Á\$(Â Ï Å\$^*;^^• ÁØ) ئ[•dЁ;/^^/,Á]^;ā]åk4(Hí €Á\$(Á+Î Í Å\$æê• Øæ{{ |æ)åÅk|æ•ãã&æaā]}k4(Øæ{{ |æ}åÅ(-Á }ã`^Á\$([][;œ)&^

AUdʻI b]h7ca dcg]h]cb

Úġ¯^åæ&əjåÁ¯ą¯ ậæA[ậ•KIÍÁ,^¦&^}c Úġ^åæ&g`^Ó&eajåA´ą¯ ậæÁ[ậ•KI€Á,^¦&^}c Tğ[¦Æk[{][}^}o~KFÍÁ,^¦&^}c Ò•caīæe^•Áæ^^Åaæ^^åÁ}}á`a•^/cææaī}•Ê&a^•&kiā]caī}•ÉAajåAkiæ)•^&o~Aí-Ác@Aíæi`}ãÈ

8 YgW]dh]cb`cZD]bYXU

GYH]b[

Šæ)å-{¦{ KO(æç,[[å•Á;}Á;ædā,^Ác\¦æ&∧•É妿ā,æā,æ*^,æ`•Á;}Á;ædā,^Ác\¦æ&∧• Šæ)å-{¦{ Á,[•ãa‡;}Á©,@^^Éåã; ^}•ã;}æ4DKV¦^æåÉ&æ+Éååä, Ö[,}Ë=[[]^Á:@ej^KŠāj^æ C1&¦[••Ē=|[]^Á:@ej^KŠāj^æÉ&[}&æç,^ Úæ^}o4;æ*\?æd+KÙæ)å^Áa;aá[æ;^Á;ædā,^Åå^][•ã•

Hmd]WU[·]dfcZ]`Y

CHÁC ÁTÁ3 & @•KÁ-3, ^ Á æ) å ÒÁŻFÁ4 Á Á9 & @•KÁ-3, ^ Á æ) å Ó ÁŻÁ Á4 Á+Í Á9 & @•KÁ-3, ^ Á æ) å Ó * ĐÁŻÁ Í Á4 Á I Á9 & @•KÁ-3, ^ Á æ) å^ Á1 æ Ô* ÁŻÁ I Á4 Á EÁ9 & @•KÁ-3, ^ Á æ) å

DfcdYfhJYg'UbX'ei U']hJYg

Ú [[]^K €ÁţÁGÅ,^\&^} c Ö^] c@áţÁ^• cl & cáţ^^A & æč ¦^KT [!^Ás@e) Å €Áş & @ • Ö'æj æč^Á\$|æ• KÚ [[!]^Ás!æj ^å Ü`} [-Á\$|æ• KÚ [[!]^Ás!æj ^å Ü`} [-Á\$|æ• KÚ [[!]^Ás!æj ^å @ Ôæj æ&át Á -Á@A [• AA] ã aj * Áæ^ / Át Átæ) • { ãtÅ æc* ! ÁÇS • æDKP ð @ÁÇF È Ì Át Á È Í Á ĝ E@D Ö^] c@át Á æc* ! Áææi /^KOE [` cĥÁţÁt Át Ás & @ • Ø',^``^} & A [- Á] [åð * KÞ [}^ Ôæj & át Á -Á[[åð * KÞ [}^ Ôæj & át Á æd] } æc* Ét æd { ` { A&[} c } ch Át Á; Ác] Å @ • E&{ D Ù [åã { Aœi []] cáj } Áæat Ét æd { ` { KE Oçæi [` ch È Áş & @ • D

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Šæ) å/&æ) æiðjár Áklæ• áðaænj } Ágj lå æ^å DxÁÞ[}^Á]^&ãæ å Šæ) å/&æ} æiðjár Áklæ• áðaænj } Ág [}ðl/ðlæ^å DxÁÞ[}^Á] *P^å¦[|[* &AÛ[44*Õ; [*] *k*40BÖ

Ø[¦æ[†]Ă[´]ãææàġãã Ă[´]] KAÙæ) åˆÁ;ç^¦Á[æ; ˆÁ[ā•Á; }Á¦ææ•Á; Á@ å¦ã&4; ¦Á; ^•ã&Á |[, |æ) å•ÁÇÕ FÍ Í ÝÓGI FØŠD

Uc@¦/áç^*^œæãç^A&yæ•ãã&æaā;}/KÁÙ[čœ%20|[¦ãåæÁ20|æç;[[å•ÁQÜFÍÍÝŸ€€H2ŠDÂÂÚæ)å^Á [ç^¦Á[æ; ^Á[ã;•Á;}Á|æ;•Á; Á@å¦ã&á;¦Á; ^•ã&Á[, |æ)å•ÁQÕFÍÍÝÓGIF2ŐSD P^å¦ã&Á[ã;Áæāj*KÁÞ[

8 YgW]dh]cb`cZD]bYXUžK Yh

GYH]b[

Šæ)å-{/{ KÖ¦ænja æ*^, æ*•Á;}Á, æbja^Ár\¦æ&A*•ÉNænvÁ;}Á, æbja^Ár\¦æ&A* Šæ)å-{/{ Á[•ãnja}A©@^^Ëaā[^}•āj}æDKV¦^æbÉbbajEÅæ)-Ö[,}Ë=[[]^Á@ej^KŠa}^æ OB&{[*•Ë=[[]^Á@ej^KÔ[}&æe;^Ê4ja^æ Úæ^}oA(æe*\ãee/KŪæ)å^Áa)aÁ[æ{_^Á;æbja^Åb^][*ãn

Hmd]WU[·]dfcZ]`Y

CHEXE ÁI ÁFÁI & @ • KÁ-∄ ^ Á æ) å Ò ÁEÁ ÁI ÁI ÁI & & @ • KÁ-∄ ^ Á æ) å Ó ÁEÁ ÁI ÁI ÁI & & @ • KÁ-∄ ^ Á æ) å Ó * EDÁEÁI ÁI ÁI ÆI & & & @ • KÁ-∄ ^ Á æ) å^ Á[æ Ô * ÆAI | ÁI Á € ÆI & @ • KÁ-∄ ^ Á æ) å

DfcdYfhJYg'UbX'ei U']hJYg

=bhYfdfYh]jY"[fcidg

Šæ) å Akæj æiðjāñ Ákjæ• á 38ææji } Ági lâtær å DAKÞ[}^Á]^&āð å Šæ) å Akæj æiðjāñ Ákjæ• á 38ææji } Ági [} áliðt ær å DAKÞ[}^A]^&ãð å P^å l[[[* & AÛ[ðµÔl [č]] KAOEÖ Ø[læ* ^ Á šaæiðjāñ Át l[č]] KAÙEð Ø[læ* ^ Á šaæiðjāñ Át lč] Ø[læ* ^ Á šaæiðjāñ Át læ* Å kAÙE [] að å• Ágō FÍ Í Ý ÓGI FØŠD P^å læ A[ðµÁæjð * KAŸ^•

A]bcf^{'7}ca dcbYbhg

: ƳXU

Ú^¦&^}ớ(-Á; aġ Á'}ãtAÎ Á;^\&^}c Šag`å-{'{ KO|aeerÁ;}Á; aġā;^Ác`¦!ae&^•Éås!aaājæ*^, æ`•Á;}Á; aġā;^Ác`¦!ae&^• Šag`å-{'{ A∫[•ãaā;}Áçô@^^Éäā[^}•ã]}adDKV¦^aeåÉkæa‡Éåsā] Ö[,}E¤[[]^Á;ôda;^KŠā;^ae O&'[••ɤ[]]^Á;ôda;^KŠā;^ae

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Uc@;/Áş^*^œæãç^∕Á&/æ••ãã&æãā;}KÙ|[`*@ÁÇÜFÍÍÝŸ€FFØŠDÁÐ)æ)å^Áţç^;Á[æ{^Á[ā+Á
[}Á|ææ∱{~Â@å¦&A{{ ^•ã&A{[]}}}a•ÁÇÕFÍÍÝÓGIFØŠD
P^å;&A{[ā∱áæā]*KAŸ^•
```

K UVUggc

Ŭ[~]/&^}ơĄ -Ą aġ Á }ãkH-Ą ^¦&^}c Šaġ å { /{ KO|æç [[å•Ą]}4 (aġ ^k*)¦æ&^• Šaġ å { /{ KO|æç [[å•Ą]}4 (aġ ^k*] aġ ^k*)¦æ&^• Ŏ[,}Ê[]^^A @ġ ^KŠāj ^abÉ&[}ç^¢ O&/[••Ē|[]^A @ġ ^KŠāj ^ab Uc@!Aç^*^œaāç^Ák|æ•ã&aaāj }KÙ[čo@k0|[¦ãaaki0]æç [[å•ÁçÜFÍÍÝŸ€€HØŠDÂŪaġ å^Á •[ā•Ą] Á|ææ Ą -Ą ^•&A, ¦Á@ å¦&A[[]aġ å•ÁçÕFÍÍÝÓFIFØŠD P^å!&A[āÁaæāj *KAÞ]

JՐ_Մ]Ս

Ú^¦&^}ớţ - Ấ æj Á }ãłKGÁ^¦&^}c Šæjå-{ ¦{KÖ|æj}æ*^, æ•Á;}Á|ææ•Á;}Á, ædj,^Ác^!!æ&^• Šæjå-{ ¦{KÖ|æj}æ*^, æ•Á;}Á|ææ•Á;}Á;ææ‡ Ö[, }Ë=[[]^Á@j^KŠj^æ Œ&'[••Ë=[[]^Á@j^KŠj^æ C&;[••Ë=[[]^Á@j^KŠj^æ C&;[••Ë=[[]^Á@j^KŠj^æ C&;[••Ë=[[]^Á@j^KŠj^æ C&;[••Ë=[[]^Á@j^KŠj A@j^KŠj C@;Aş^*^œæj^Á&]æ•ãæææj}KÙ|[`*@AÇÜFÍÍÝŸ€FFØŠDÂÛæjå^Á[]a•Á;}Á|ææ•Á;-Á {^•&A;¦A@å}&&A[], |æjå•Á;ÕFÍÍÝÓFIFØŠD P^å}&A[] ĴÁææj*KAŸ^•

6 fmbk_ccX

Ú^/&^}ơf, Á; æj Á}ãKGÁ,^!&^}c Šæ)å-{:{KO|æç, [[å•Á,} Á; æð],^ko^!!æ&^• Šæ)å-{:{Aj[•āāj}AGO(^^Ëa],^}•ā O[,}Ê"[]^A:@ej^KŠ],^æ OE![•Ē"[]]^A:@ej^KŠ],^æ OE![•Ē"[]]^A:@ej^KŠ],^æ Uc@!Aç^*^cæāç,A&|æ•ēã&æaj}KÙ[čo@kO|[¦ãaækO|æ; [[å•ÁçÜFÍÍÝŸ€€HØŠDÉQ)æ)å^Á •[ā•Á;}Á|ææ•Á;-Á;^•&æ4;!Á@å!ã&A[,]æ)å•ÁçŨFÍÍÝÓFIFØŠD P^å!&&A[ā/Aæaj*KÝ?•

7 mdf Ygg ~U_Y

Ú^i&^}of, -Á, æj Á }ãtKGÁ,^\&^} c Šæjå-{ /{ KÖ|æği,æ*^, æ`•Á; }Á, æbji^Ác^!!æ&^•Ê4¦ææ•Á; }Á, æbji^Ác^!!æ&^• Šæjå-{ /{ KÖ|æği,æ*^, æ`•Á; }Á, æbji^Ac^!!æ&^•Ê4jææ•Á; }Á, æbji^Ac^!!æ&^• Ŏ[, }Ĕ=[[]^A: @eji^KŠaj^æE&[] ç^¢ O&:[••E=[[]^A: @eji^KÔ[] &æç^ÊAj^æ Uc@:/Áç^*^œæçi^Ák]æ••ãææqi }KÙ[`c@AO[[:åaæAO]æç; [[å•ÁÇÜFÍÍÝŸ€€+10ŠDÂQ)æ}å^Á [ç^!Á[æti^Á[ā+Á; }Á|ææ•Á;-Á@å:1&A[:A[^•&&A[:] |æ)å•ÁÇĎFÍÍÝÓG:FØŠD P^å:/&A[ā4áæzi]*KŸ/*•

F YZYf YbWYg

OE(^¦&3aa)ÁOE•[&ãaeeaā[}Á(-ÁÚcaee^ÁP?ã@)æâÁea)åÁ/¦æ)•][¦cæeaā[}ÁÚ~æ8ãae‡•ÁQCEOEÙPVUDEÄ GEEIEÁÚcaa)忦åÁ]^&ãaãaaeaā[}•Á[¦Ás!æ)•][¦cæeaā[}Á(æee^¦ãae‡•Áea)åÁ(^c@?lå•Á(-Á*æe{]|ā]*Á æ)åÁe∿•cā]*EÁGIc@Á*åãaā[}È

OĘ ^¦a3æ) ÂÙ[&&^ĉ ÁʦÁ^•cā}*Áe) åÁTæc^¦ãe)+ÁÇCÈÙVTDÈÁGEEÍ ÈÅÙæ) 忦åÁ&|æ•ãa3ææa‡i}Á,-Á •[ā)•ÁʦÁ}*āj^^¦āj*Á,`¦][•^•ÈÓCÈÙVTÂÙæ) 忦åÅÖGIÌÏËEEEÈ

Ô[, æláð) ÉÉSÈT ÉÉSA ÉÓæloc ¦ÉACÉÓ ÉÁÕ[|^ dÉse) á ÁÒÈ /ÉŠæl U[^ ÉÁTJ I JÉÓ |æl • ã Baædai[} } Á; Á , ^ dæ) á • Áse) á /áu^^] É; æc ¦ Á@æia ãæer Á; Ás@ ÁV} ãr à Á Uæer • ÉÁVÉ DÉKÖzei @áse) á Á/ ðjá |ã^ Á , U^ ¦ç 38/ ÁØY Ù EU Ó Ú ÉI JENFE

Ø^å^¦æ¢ÄÜ^*ã@^¦ÈÆč|^ÁF;HÊÆ;JJIÈÔ@æ;)*^•Á§jÁ@å¦&&A{[ã]•Á;~Ás@AN}ãc^åÂÙœæc^•È

Ø^å^¦æ|ÁÜ^*ãe^¦ÈÛ^] c^{ à^¦ÁFÌ ÊÖ€€€€Ě₽^å¦ã&Á[ã+Á; Á\$@^ÁN}ã^åÂÙcæe^•È

P*¦0ÊŰŐÈYÉÉÁee)åÁSÈTÉÁKæejázætÉA*åãt{¦●ĚKA*¦●ãţ}Â`ÈEÉÆO€€ÊÉÆØã*|åÁsjåä8zæt{¦●ÁţÁ@å¦&SÁ ●[ã=ÁsjÁ@AW}ãe*åÁÚcæe*●È

Þænāj}ædÁÜ^•^æd&@4Ô[`}&ajeEkFJJÍĖÉY^dæ);å•kkÔ@eelæ&ec\lãrca&e-Áeejå/Asi[`}åæda?•È

$$\begin{split} \dot{U}[\frac{1}{4}\hat{A}]^{*} & |c^{^{}}\hat{A}] & \hat{O}[\frac{1}{4}\hat{A}] & \hat{$$

Ù[ā¦ÁÙ ˈ¦ç^^ÂÙcæ-ÈÉFJJJÈÙ[ā¦Áæa¢[}[{ ^ kK0 Eásæ 824 ^ • c*{ Aţ - Á+[āļA\$k|æ • ãã8æaāt}}Á[¦Á {æ}āj*Áæ)åÁsjc*¦]¦^cāj*Á[āļÁ č ¦ç^^ • ÈÁG}åÁ*åãaāt}ÈÉPæcč ¦æ‡ÁÜ^•[č ¦&^•ÁÔ[}•^¦çæaāt}}Á Ù^¦çã&^Ê4WÈÙĚÖ^]æac{ ^}c∱, AÔE°¦ã&č |c ¦^ÁPæ)åà[[\Á HÌĚČ@cd]HBD ,,, Èj¦&•È • åæÈ°[çĐ]•Đ[['cæ4D]¦&•Đa^cæáaĐ)æaāt}}æaāt}}æab[ā•ĐÑ&ããM}¦&•FIG]G´€ÍHÍÏÏÁ

$$\begin{split} \dot{U}[\hat{a}A\hat{U}^*]_{\varsigma}^{\Lambda}A\hat{U}_{case} \stackrel{_{\sim}}{\to} \hat{A}[\hat{a}A\hat{I}[\hat{a}A\hat{case}[]][\{\hat{a}A\hat{case}\hat{I}\}\hat{a}A\hat{a}\hat{a}\hat{a}\hat{a}\hat{I}\}\hat{E}AVE\hat{U}E\hat{U}^{\Lambda}] & = \hat{A}\hat{U}^{\Lambda} \hat{A}\hat{A}\hat{I} \hat{A}\hat{U}^{\Lambda} \hat{A}\hat{I} \hat{A}\hat{U} \hat{A}\hat{I} \hat{I} \hat{A}\hat{I} \hat{I} \hat{A}\hat{I} \hat{I} \hat{A}\hat{I} \hat{I} \hat{A}\hat{I} \hat{I} \hat{I} \hat{I}$$

,,,È;¦&eÈ•åæèĚ[çÐ]•Ð)[¦æaþD)¦&eÐå^æaáþD)æaáį}æaáþ[ðeÐÑ&aáM}¦&eFIG]G´€ÍHÍÌ€Á

V3]^¦ÉÐÜÈY ÈÉERÈÆFJÌÍÉÀY ^d;aa)å•Á(, ÁÖ^|aç, æs^ĚANÈÜÈAØãe, @ása)åÁY 4jå∥ã^ÁÛ^¦ça3∆Ása)åÁ Ö^|aç, æs^ÁÖ^]æsid(^}of(, Á⊐æcč, ¦æs4ÁÜ^•[č, ¦&^•Ása)åÁÔ}çã[[}{ ^}cag4Ô[}d[|ÉEY ^d;aa)å•Á Ù^&ca[]}È

W}ã& åÁÜcæet∿•Á0E{ ^ÁÔ[¦]•Á(-ÁÔ}*ā)^^¦•ÉÔ}çã[]{ ^}cæ¢/Šæà[¦æq[¦^ÉĂFJÌÏĖÓÔ[¦]•Á(-Á Ò}*ā)^^¦•Á ^dæ)å•Áå^|ā)^æqā(}Á(æ)`æ¢ÉÁYæet\;æî•ÁÔ¢]^¦ã(^}oÁÚcæqã(}Á/^&@)&&æ¢Á Ü^][¦oÁŸÉİÏËFÈ

W}ã&åÂÜcæet∿ÁÖ^]ætd(^}d\E'¦ã&`|c`¦^ÊÉÞæet`¦ædÁÜ^•[`¦&^•ÁÔ[}•^¦çæetā}ÀÛ^\çã&^ÈÁ Þæetā}}ædÁ[¦^•d^Á(æ)`ædÉÃ@cd;Heng,jÈ;l&•È•åæeE`[çÐ]]•Ð[¦ædÐ}¦&•Eå^œatB•[ā+Đ @{{^ĐÑ&ãaM};l&•FICJC´€ÍHHÏ|Á

W,ãx°åÁÜcæex°•ÁÖ^]ælq(^}qÁ_É`¦ã&`|č'¦AÊÞæeč'|æ4Ü/^•[`'\&^•ÁÔ[}•^\çæaā[}ÁÛ^\çã&^ÈA Þæaā[}æ4Áæ)*^Áæ)åÁjæeč'¦^Á@e)åà[[\Èé@ed]H@D, ¸È;\&•È•åæÈ`[çÐ]•Đ][¦æ4Đ]\&•Đ å^cæáaĐ æaā[}æda)å`•^Đæ)*^]æcč'¦^ĐÑ&ããM•c^|]¦åàF€IHÈIIÁ W)ãt^åÂUææt^•ÁÖ^]æt(^}ơ[\, 40E ¦&&`|č ¦^ÊPæč ¦æ4Ü/•[`|&^•ÁÔ[}•^¦çæaā[}ÂÛ^\çã&^ÈÁ Þæaā[}æ4Á[ā]Á` ¦ç^^Á@ea)åà[[\Ê&ād^Á HEËXOÈ@ed]Heey], È ¦&•È•åæÈ[çç]]•Ð[¦æaaĐ }¦&•Êa^œãaĐ[ā]•Ð&ā*}œão•ĐŇ&ãaM}¦&•FIC]Cí€ÍICICÁ

 $\begin{array}{l} & \forall \mathbf{A} \hat{\mathbf{A}} \hat{\mathbf{A}} \hat{\mathbf{C}} = \hat{\mathbf{A}} \hat{\mathbf{C}} \hat{\mathbf{A}} \hat{\mathbf{C}} \hat{\mathbf{C}} \hat{\mathbf{A}} \hat{\mathbf{C}} \hat{\mathbf{C}} \hat{\mathbf{A}} \hat{\mathbf{C}} \hat{\mathbf$

 $\begin{array}{l} & \text{W} \quad \mbox{ac} \wedge a \hat{A} \cup c \not = \hat{A} & \text{W} \quad \mbox{ac} \wedge a \hat{A} & \text{W} \quad \mbox{ac} \wedge a \hat{A} & \text{W} \quad \mbox{ac} \wedge a \hat{A} & \text{W} \quad \mbox{ac} \wedge a \hat{A} & \text{W} \quad \mbox{ac} \quad \mbo$

5 DD9 B8 =L '7 '

I B= = = 98 GC = @7 @5 GG= = 75 H=C B GMGH9 A fl G7 GLË 7 @5 GG= = 75 H=C B 5 B8 7 C BG=GH9 B7 M7 < 5 F HG

		an and and a															
g	OARS	E-GRA nd sand density	INED SO ds and (2) as deterr	NSISTENCY OR CONDITI ILS (major portions retained) silty or clayey gravels and nined by laboratory tests or	d on No. 200 sie sands. Conditio standard peneti	n is rate ration re	ed accord	ling to	System and inclu	are based on the United S de consistency, moisture, a been modified to reflect re	and c	olor.	Field		est		
		De	Very lo Very lo Loose Medium Dense Very de	ose 0 to 15 % 15 to 35 % 1 dense 35 to 65 % 65 to 85 %	< 4 4 to 10 10 to 30 30 to 50	0			locations. 3. Descriptions or boring locations a	ons are based on topograp these boring logs apply o nd at the time the borings to be representative of subsi	niy at were	the mac	specifie. The	ic ey ar	re		
o ra	rganic ated ac	silts and cording	d clays, (2		ays, and (3) clay y penetrometer r	ey silts	Consist	ency is	SOIL SYMBOLS			SILT SAN] 🛛		oth		
		De	Very so Soft Medium Stiff Very sti Hard	ft < 25 25 to 50 n stiff 50 to 100 100 to 200					PEAT PEAT PEAT PEAT PLASTC	CHRANC CLAY CLAY LIME CONCANC CLAY CLAY LIME CONCANC CLAY CLAY CLAY CLASTIC PLASTIC WEA	SHLY THERED	LIMEST					
Ma	ajor Div	isions	Group	Tunical Nam	di tan di sana si di sana si s			Labor	atory Classification	A CONTRACTOR OF THE OWNER OF THE		1	Τ				
More than half the material is larger than No. 200 sieve size)	raction size)	gravel no fines)	GW	Well-graded gravels, grav mixtures, little or no fines	vel-sand			$C_{0} = \frac{D_{60}}{D_{10}}$	c_0 greater than 4; $C_c = \frac{(D_{20})^2}{D_{10} \times D_{60}}$ between 1 and 3			Sieve sizes	<#200	#200 to #40 #40 to #10	#10 to #4		
	els i coarse fr o. 4 sieve	Clean (Little or I	GP	Poorly-graded gravels, gravels, gravels, little or no fines	avel-sand	loo bis*	dual symbols*	Not meeti	ng all gradation requin	ements for GW	Size	Sieve	* v	0b#	#10		
	than rger th	Gravel with fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand- mixtures	-silt	rain size cu			limits below "A" less than 4	Above "A" line with P.I. between 4 and 7 are border-		_					
	(More is lar	Gravel v (Appr amount	GC	Clayey gravels, gravel-sar mixtures	nd-silt	avel from g tion smalle	SM, SP SM, SC s requiring	Atterberg line or P.I.	limits above "A" greater than 7	line cases requiring use of dual symbols	Particle	4		00	76		
material is	fraction e size)	Clean sands (Little or no fines)	SW	Well-graded sands, grave little or no fines	lly sands,	and and gr fines (frac	GW, GP, S GM, GC. erline case	$C_{u} = \frac{D_{60}}{D_{10}}$	greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3			mm < 0.074	0011200	0.42 to 2.	2.00 to 4.76		
in half the	Sands han half of coarse fraction ler than No. 4 sieve size)	Clear (Little o	SP	Poorly-graded sands, grav little or no fines	velly sands,	lages of se centage of ned soils a	lages of si centage of ned soils a rcent	Ine percentages of sand and gravel from grain size curve, ing on percentage of fines (fraction smaller than No. 200 parse-grained soils are classified as follows: than 15 percentGM, GP, SW, SP than 15 percent GM, GC, SM, SC 2 percent Borderfine cases requiring dual symbols*	oarse-grained soils of than 5 percent	Not meeti	ng all gradation require	ements for SW					
(More that	Sa than half aller than	vith fines eciable of fines)	SM	Silty sands, sand-silt mixtu	ires	ne percenting on percenting on percenting on the form of the form 12 percenting of the form 12 percenting of the form of the f	ne percen ing on per oarse-grai than 5 pe than 12 p			Atterberg line or P.I.	limits below "A" less than 4	Above "A" line with P.I. between 4 and 7 are border-	erial	Silt or clav		Medium	Ise
	(More th is small	Sands with (Apprecia amount of t	SC	Clayey sands, sand-clay n	nixtures	Determit Dependi sieve) co	Determine Depending sieve) coan Less the More th	Atterberg line or P.I.	limits above "A" greater than 7	line cases requiring use of dual symbols	Materi	Silt or	Sand	Mec	Coarse		
e size)	ays 0)		ML	Inorganic silts and very fin rock floor, silty or clayey fin or clayey silts with slight p	ne sands	8	FOR CLA	RIFICATION OF I	TINE-GRAINED SOIL AND			12	in. Bi	zin.	6 in.		
). 200 sieve	Silts and Clays	less than 6	CL	Inorganic clays of low to m plasticity, gravelly clays, sa silty clays, lean clays		70 - 60 - Ē		REPEATION OF FINE-GRAINED SOIL AND INED FRACTION OF COARSE-GRAINED SOILS			ize	OICVC	#4 to 3/4 in. 3/4 in to 3 in	3 in. to 12 in.	12 in. to 36 in.		
er than No	ŝ	_	OL	Organic silts and organic s of low plasticity					- CH			-	- 194				
More than half the material is smaller than No. 200 sieve size)	ays	160)	МН	Inorganic silts, micaceous maceous fine sandy or silt organic silts		PLASTICITY INDEX	D -		- 04 - 04			11111	4.76 to 19.1 19.1 fn 76.2	76.2 to 304.8	304.8 to 914.4		
	Silts and Clays	greater than	СН	Inorganic clays of high plas fat clays	sticity,	20-		- Ch	8	MH or OH			4.7(76.2	304.8		
re than ha			ОН	Organic clays of medium to plasticity, organic silts	o high	Ċ	0 10	CL-MU ML of OL 1620 30 40 50 60 7 LIQUID LIMIT (LL)		0 80 90 100 110	Material		Fine Coarse	Cobble	Boulders		
(More	Highly	Soils	Pt	Peat and other highly orga	nic soils	Plasticity Chart			Mate	Gravel	Fine	Cob	Bould				



5; 27"Mkf tqp"Tqcf", "Ncngrcpf."HN"55: 33", ": 85/869/4: 99", "Hcz": 85/869/3992"

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Relative Consistency Chart Based on SPT Blow Count

SPT Blows	Sands	Clays	Limestone					
0	Very Loose	Very Soft	Very Soft					
1	Very Loose	Very Soft	Very Soft					
2	/		Very Soft					
3	,		Very Soft					
4	Loose	Soft	Very Soft					
5	Loose	Firm	Very Soft					
6	Loose	Firm	Very Soft					
7	Loose	Firm	Very Soft					
8	Loose	Firm	Very Soft					
9	Loose	Stiff	Very Soft					
10	Medium Dense	Stiff	Very Soft					
11	Medium Dense	Stiff	Very Soft					
12	Medium Dense	Stiff	Very Soft					
13	Medium Dense	Stiff	Very Soft					
14	Medium Dense	Stiff	Very Soft					
15	Medium Dense	Stiff	Very Soft					
16	Medium Dense	Very Stiff	Very Soft					
17	Medium Dense	Very Stiff	Very Soft					
18	Medium Dense	Very Stiff	Very Soft					
19	Medium Dense	Very Stiff	Very Soft					
20	Medium Dense	Very Stiff	Soft					
21	Medium Dense	Very Stiff	Soft					
22	Medium Dense	Very Stiff	Soft					
23	Medium Dense	Very Stiff	Soft					
24	Medium Dense	Very Stiff	Soft					
25	Medium Dense	Very Stiff	Soft					
26	Medium Dense	Very Stiff	Soft					
27	Medium Dense	Very Stiff	Soft					
28	Medium Dense	Very Stiff	Soft					
29	Medium Dense	Very Stiff	Soft					
30	Medium Dense	Very Stiff	Soft					
31	31-50 = Dense	31+ = Hard	31-49= Soft					
50+	>50 = Very Dense		50-100 = Medium Hard					
			50 for 2-5" =					
			Moderately Hard					
			50 for 0-2" = Hard					

