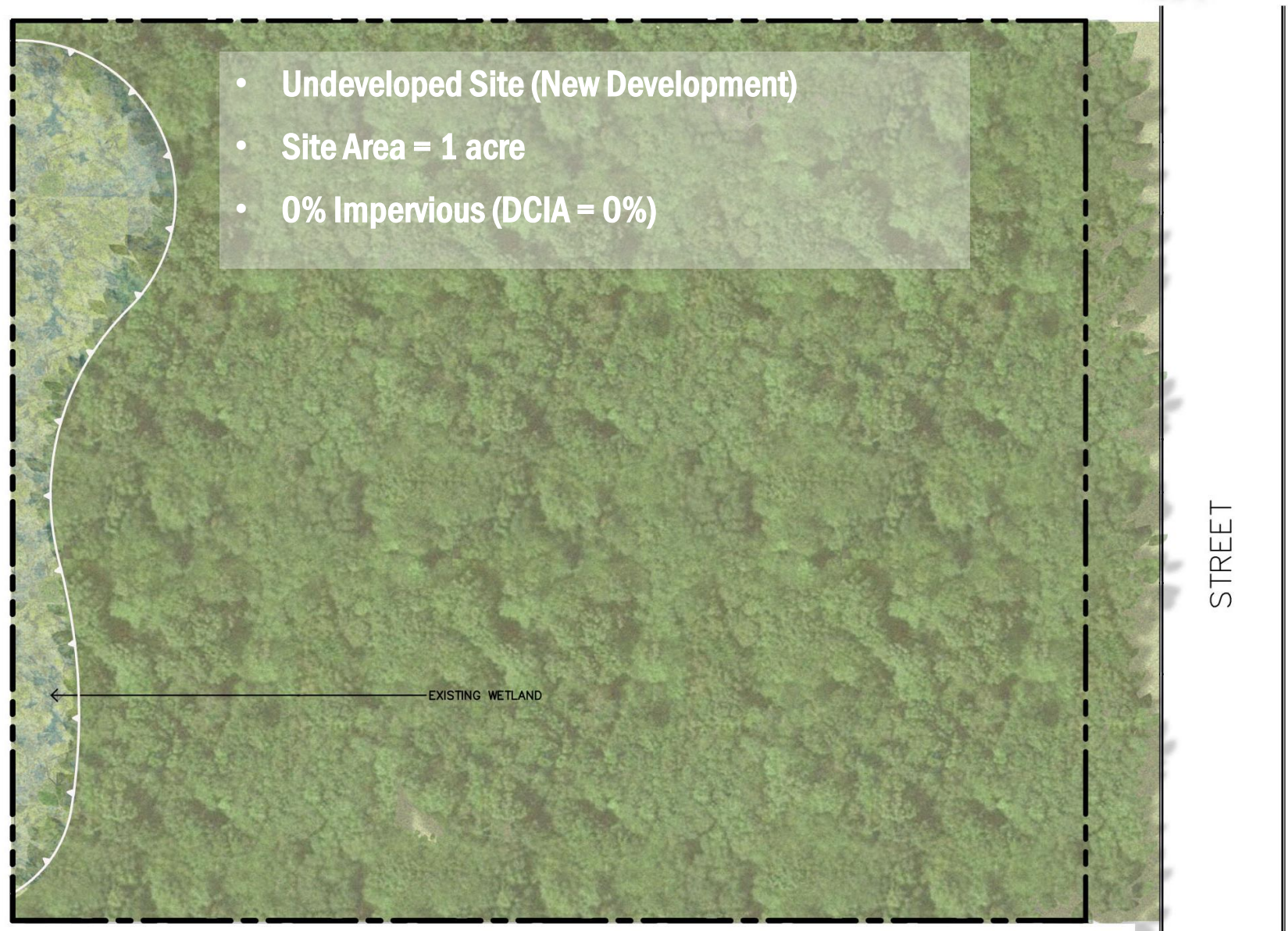


Project Examples

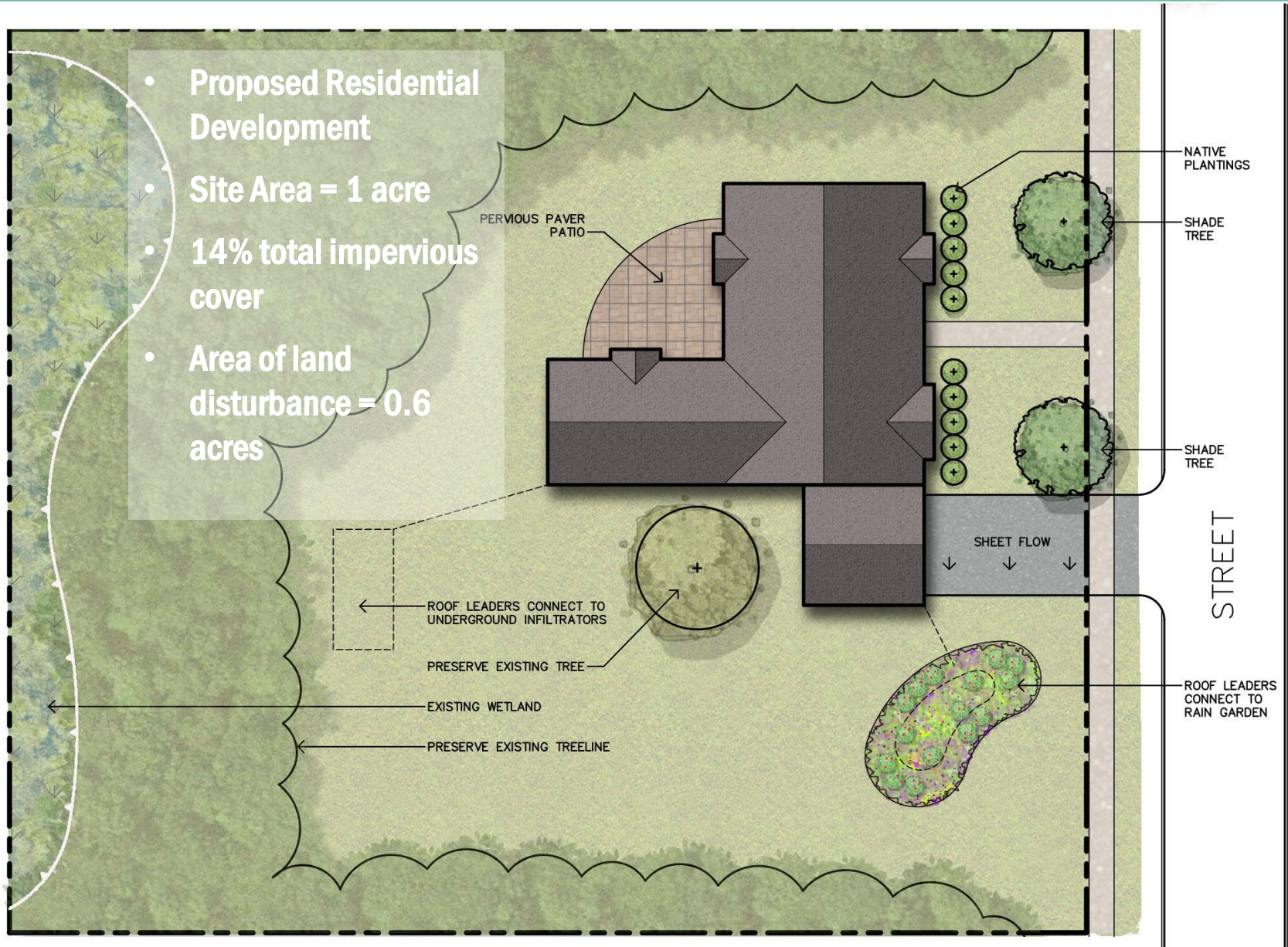
Project Examples

- **“Hypothetical” projects that reflect a range of common development types in Stamford**
 1. **Single family residential**
 2. **Mixed-use redevelopment**
 3. **Commercial redevelopment**
- **Is the project subject to the manual?**
- **Which standards apply?**
- **How to demonstrate compliance with Standard 1**
- **How to use the DCIA Tracking Worksheet**
- **Submittal requirements: “Lite” versus “Full”**

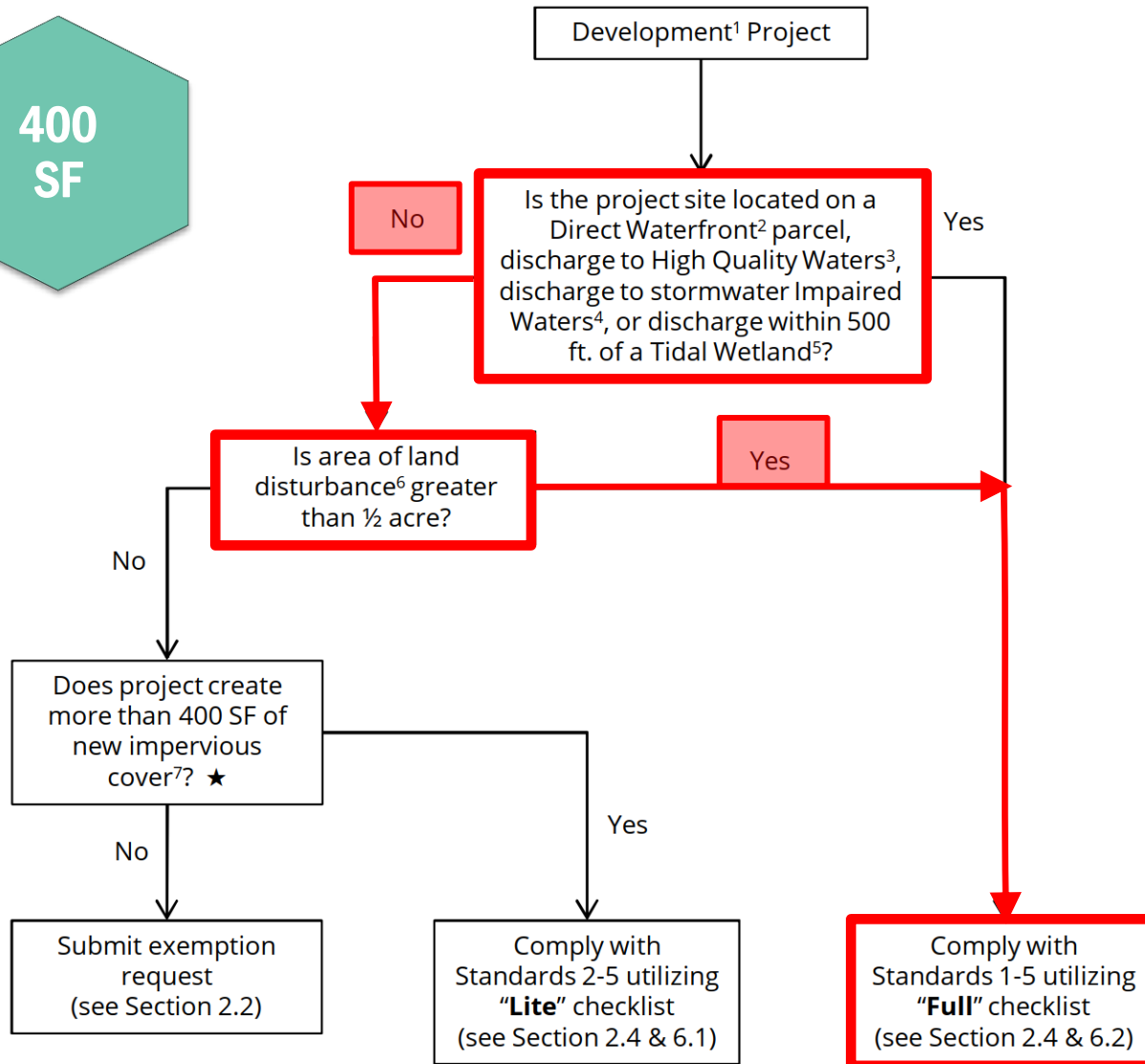
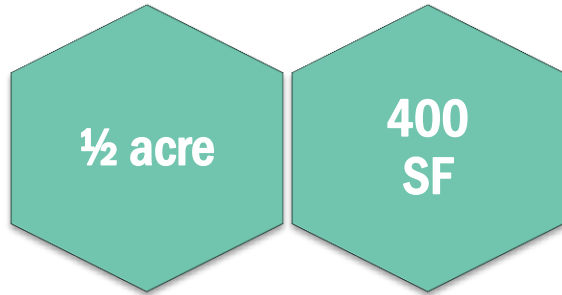
Project 1 – Single Family Residential



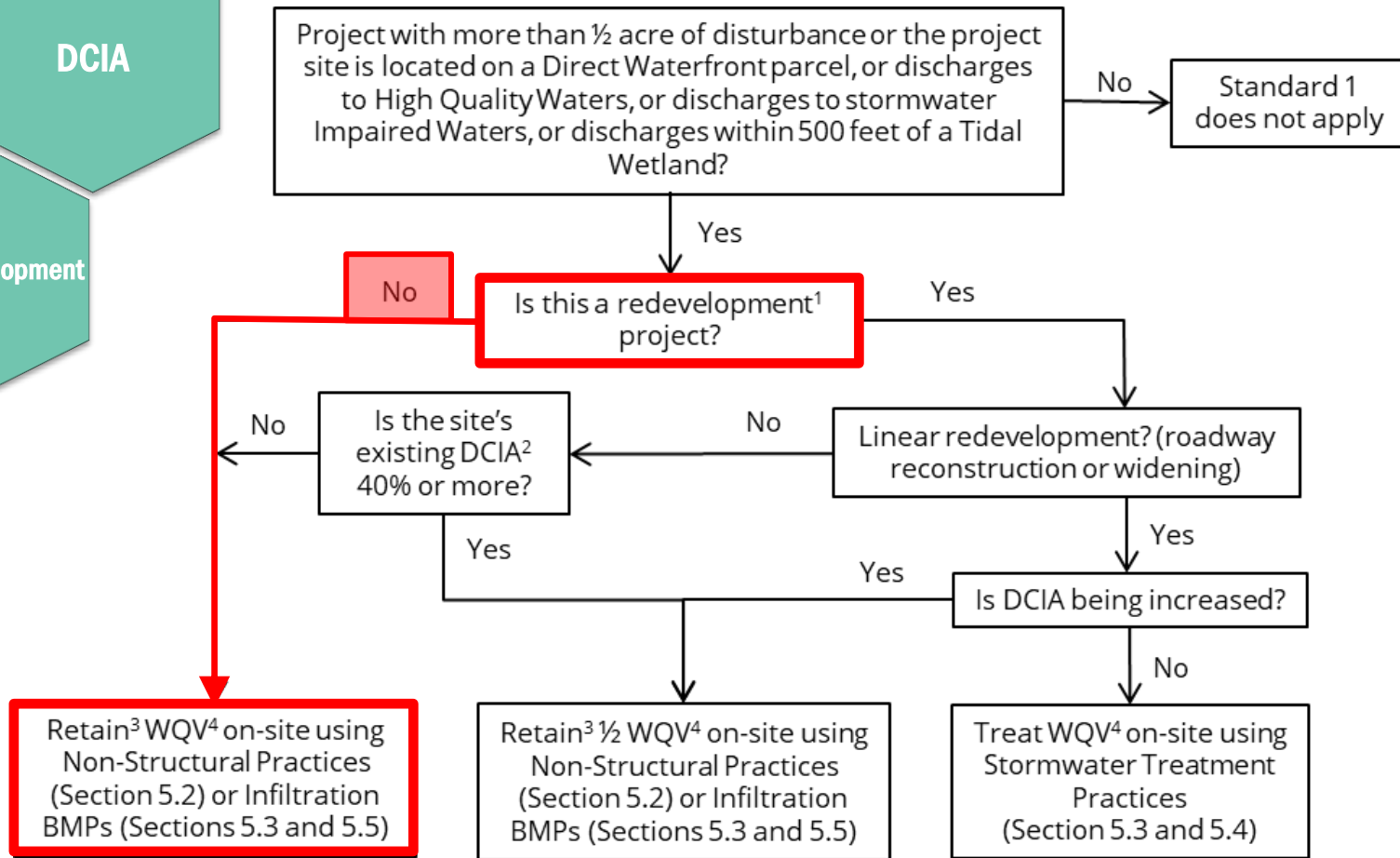
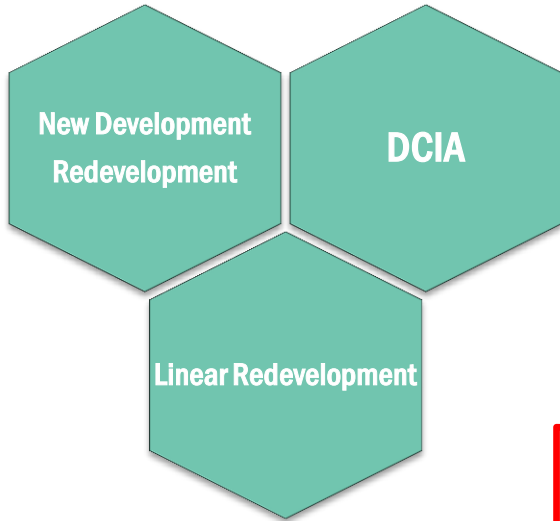
Project 1 – Single Family Residential



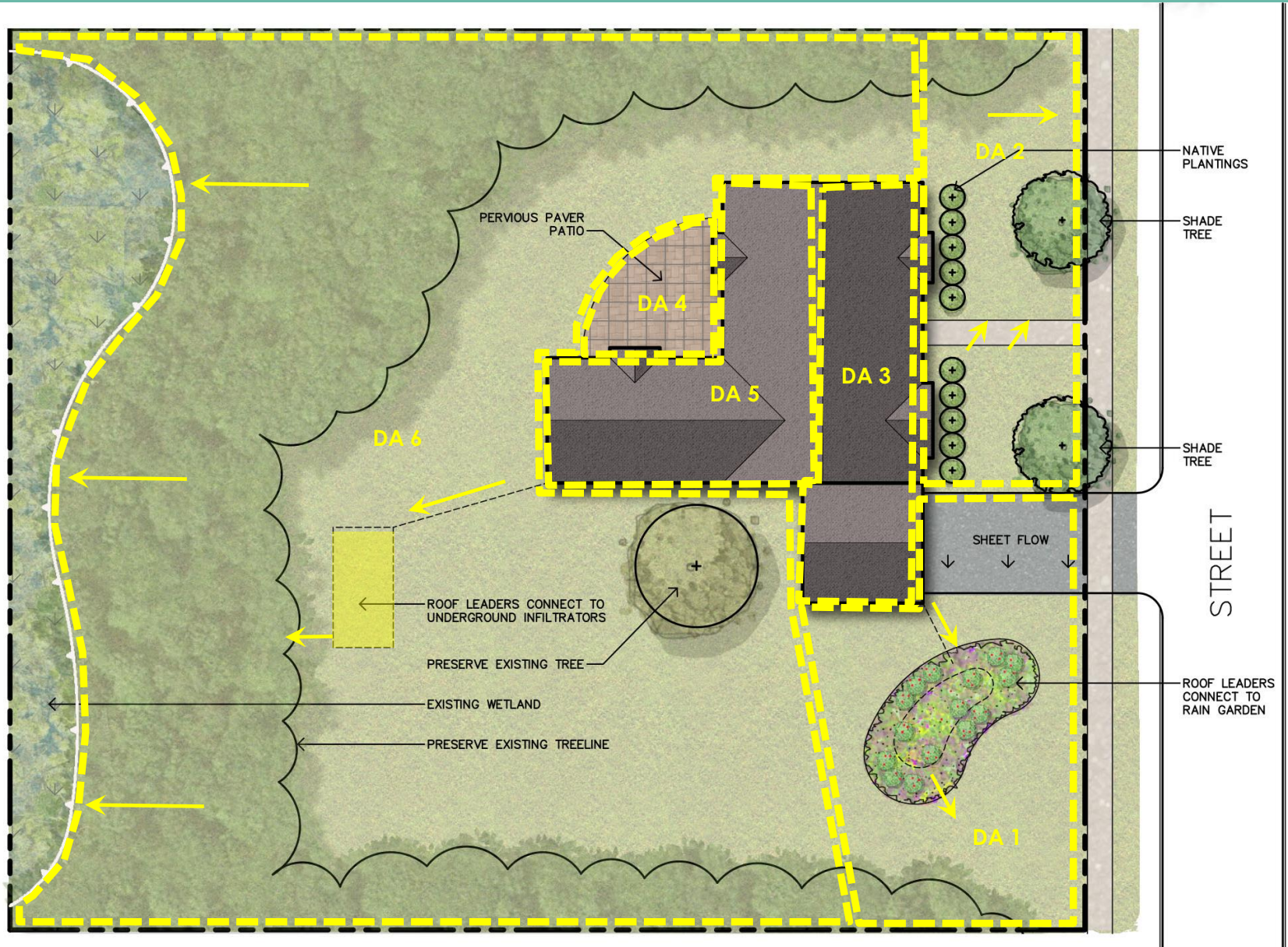
Project 1 – Standards Applicability Flowchart



Project 1 – Standard 1 Flowchart



Project 1 – Proposed Stormwater Management



Project 1 – Retention & Treatment Calculations

- New development (not redevelopment)
- Retain WQV on-site

Standard 1 (Retention and Treatment) Calculations										
Drainage Area	Drainage Area and BMP Description	Total Area	Total Area	% Impervious	Impervious Area	Runoff Coefficient R	WQV	WQV	Retention Volume Required	Retention Volume Provided
ID		(SF)	(Acres)		(SF)		(Acre-Feet)	(CF)	(CF)	(CF)
Design Point - Street										
1	Rain Garden, Driveway, and Lawn	3,400	0.078	20%	680	0.230	0.0015	65	65	340
2	Front Lawn/Paved Walkway	2,200	0.051	8%	176	0.122	0.0005	22	22	0
3	Building Roof to Rain Garden	1,800	0.041	100%	1,800	0.950	0.0033	143	143	0
		7,400	0.170	36%	2,656		0.0053	230	230	340
Design Point - Wetlands										
4	Permeable Paver Patio	800	0.018	100%	800	0.950	0.0015	63	63	88
5	Building Roof to Underground Infiltrators	2,100	0.048	100%	2,100	0.950	0.0038	166	166	360
6	Lawn/Wooded Area	30,000	0.689	0%	0	0.050	0.0029	125	125	0
		32,900	0.755	9%	2,900		0.0081	355	355	448
Site Totals		40,300	0.925	14%	5,556		0.0134	585	585	788

Project 1 – DCIA Tracking Worksheet

- New development
- No reduction in DCIA (pre- vs. post-development)

Part 2: Project Details		
1. What type of development is this? (choose from dropdown)	New Development	
2. What is the total area of the project site?	40,300	ft ²
3. What is the total area of land disturbance for this project?	26,136	ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
5. What is the <u>current</u> DCIA for the site?	0	ft ²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No)	Yes	
7. What is the <u>proposed-development</u> total impervious area for the site?	5,556	ft ²

Part 3: Water Quality Target Total		
Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	585	ft ³
Standard 1 requirement	Retain WQV on-site	
Required retention volume	585	ft ³
Provided retention volume for proposed development	788	ft ³

Part 4: Proposed DCIA Tracking		
<u>Pre-development</u> total impervious area	0	ft ²
<u>Current</u> DCIA	0	ft ²
<u>Proposed-development</u> total impervious area	5,556	ft ²
<u>Proposed-development</u> DCIA (after stormwater management)	0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>proposed-development</u>	0	ft ²

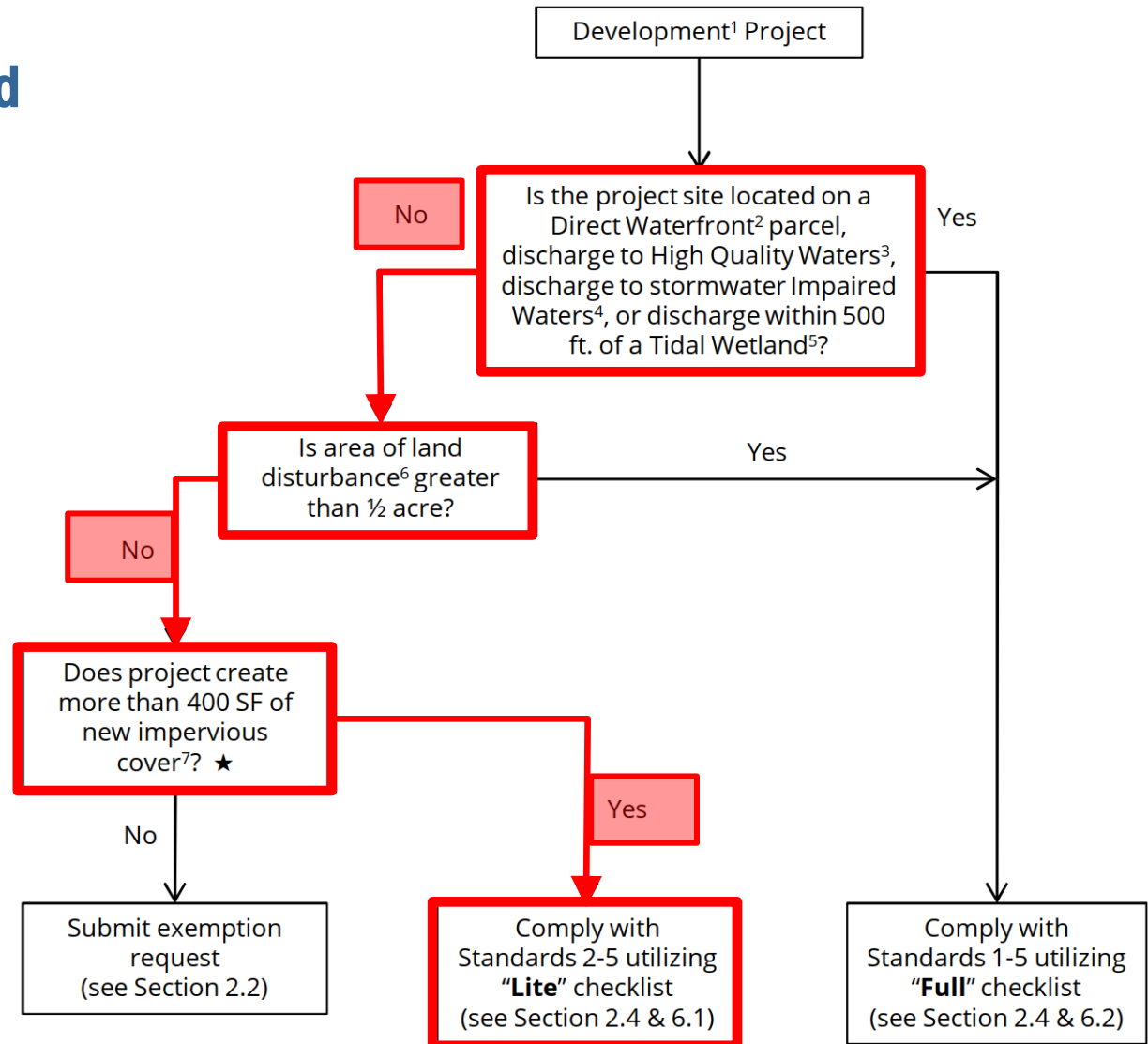
Part 5: Post-Development (As-Built Certified) DCIA Tracking		
<u>Post-development</u> (per as-built) total impervious area	5556.0	ft ²
<u>Post-development</u> (per as-built) DCIA (after stormwater management)	0.0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>post-development</u>	0.0	ft ²

Project 1 – Submittal Requirements

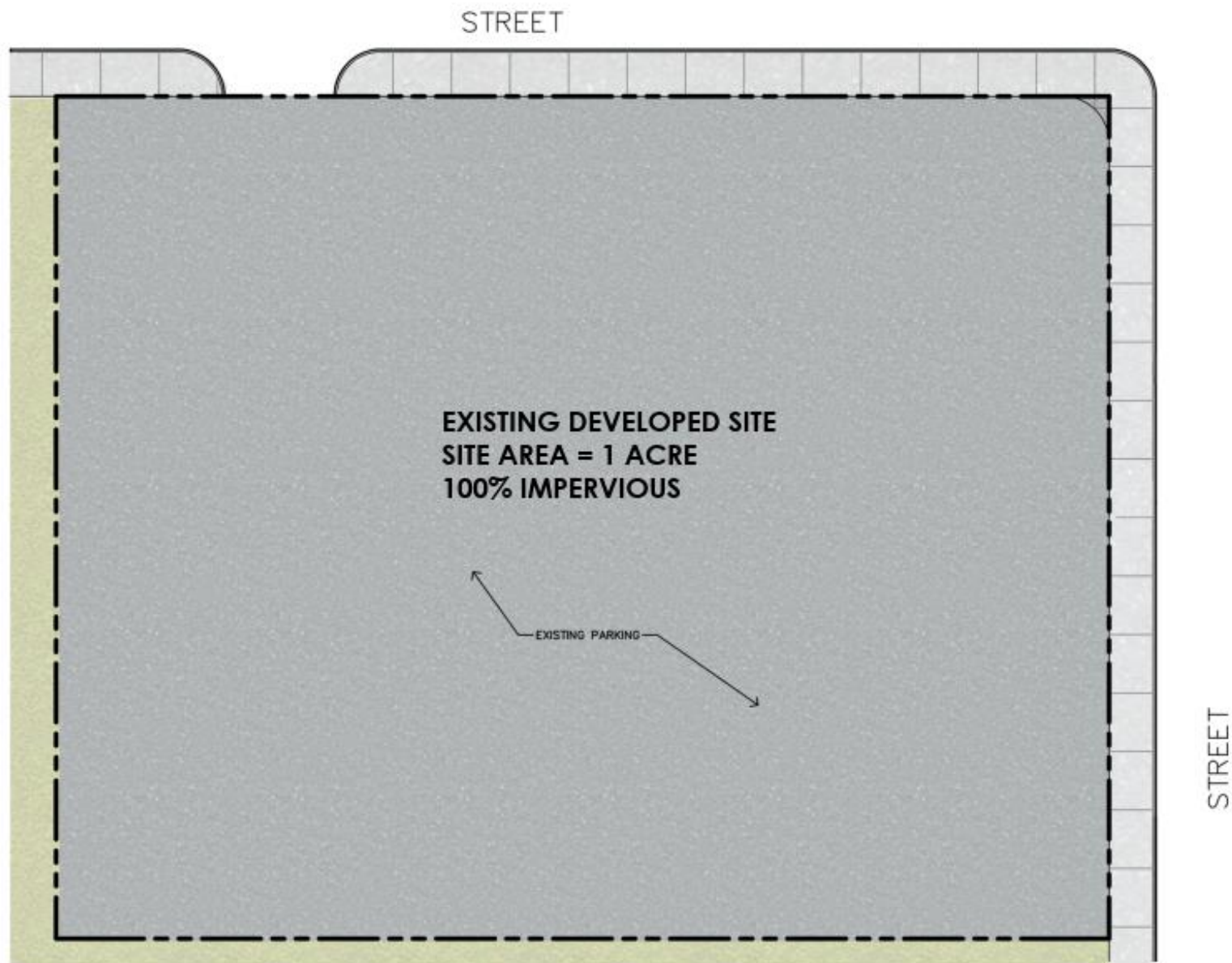
- **“Full” Stormwater Management Report**
 - **Completed Checklists**
 - **Stormwater Management Report (Narrative)**
 - **Supporting Calculations**
 - **Supporting Mapping**
 - **DCIA Tracking Worksheet**
 - **Post LID Review Map**
 - **Erosion and sediment control plan**
 - **Supporting documentation (Section 6.3)**

Project 1 – Alternative Development Scenario

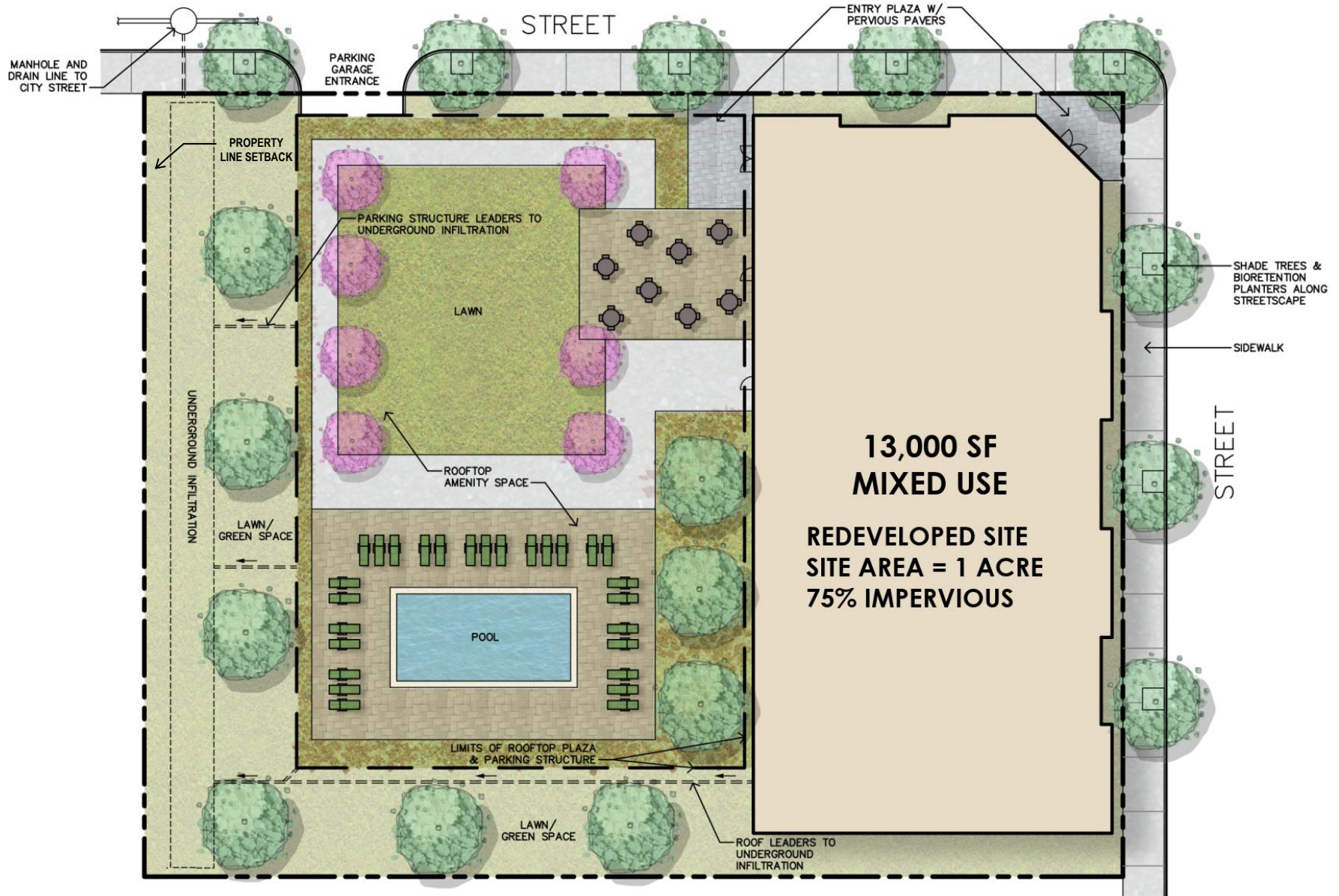
- What if area of land disturbance was limited to a half-acre or less?
- Standard 1 would not apply
- No retention or treatment required
- “Lite” Stormwater Management Report



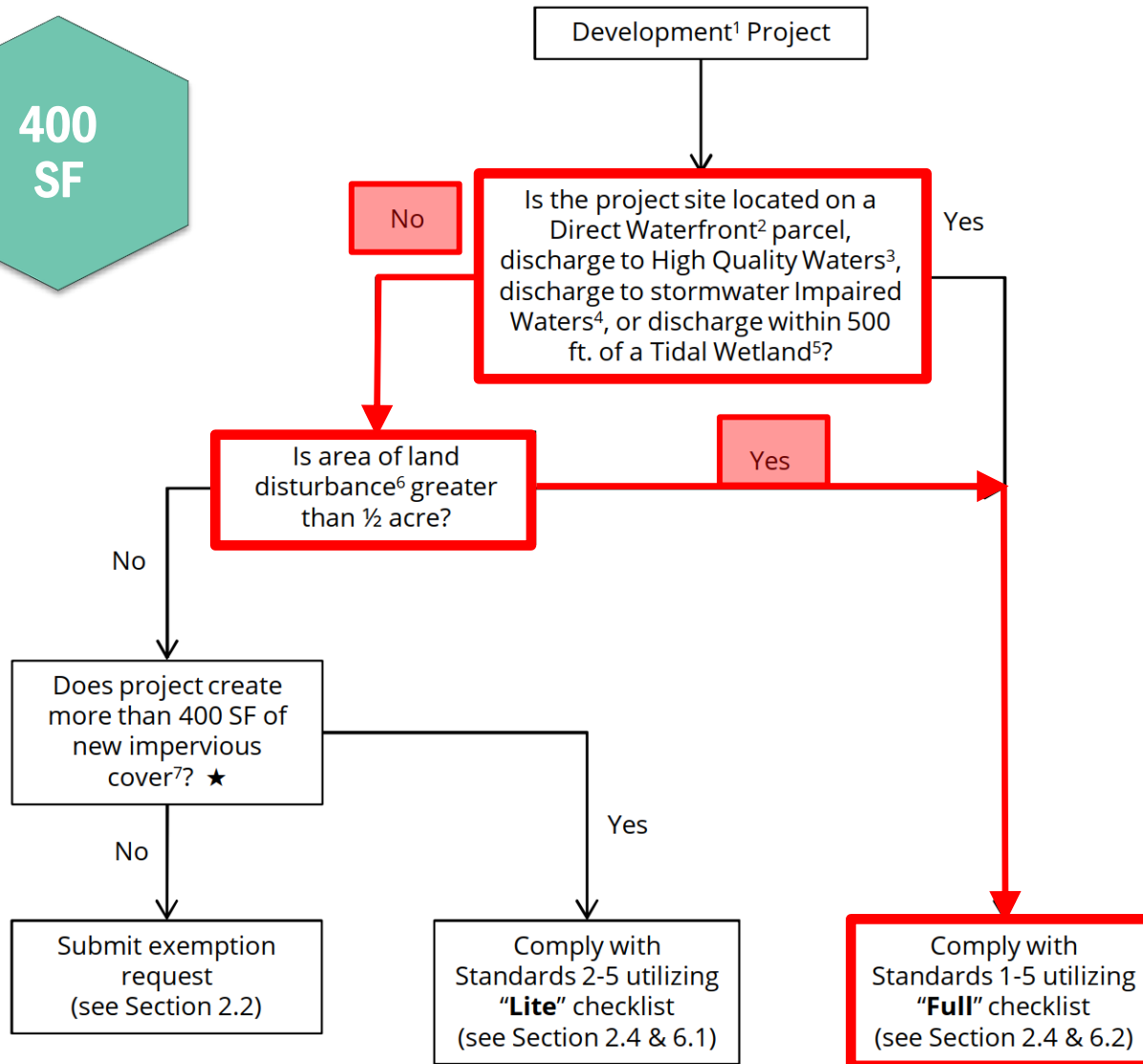
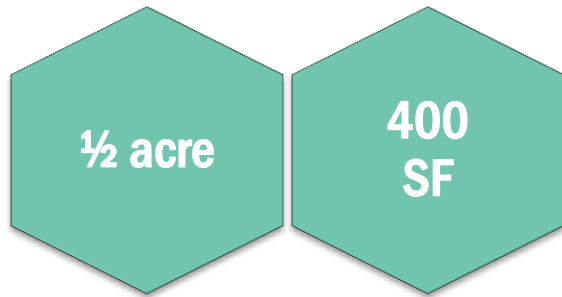
Project 2 – Mixed Use Redevelopment



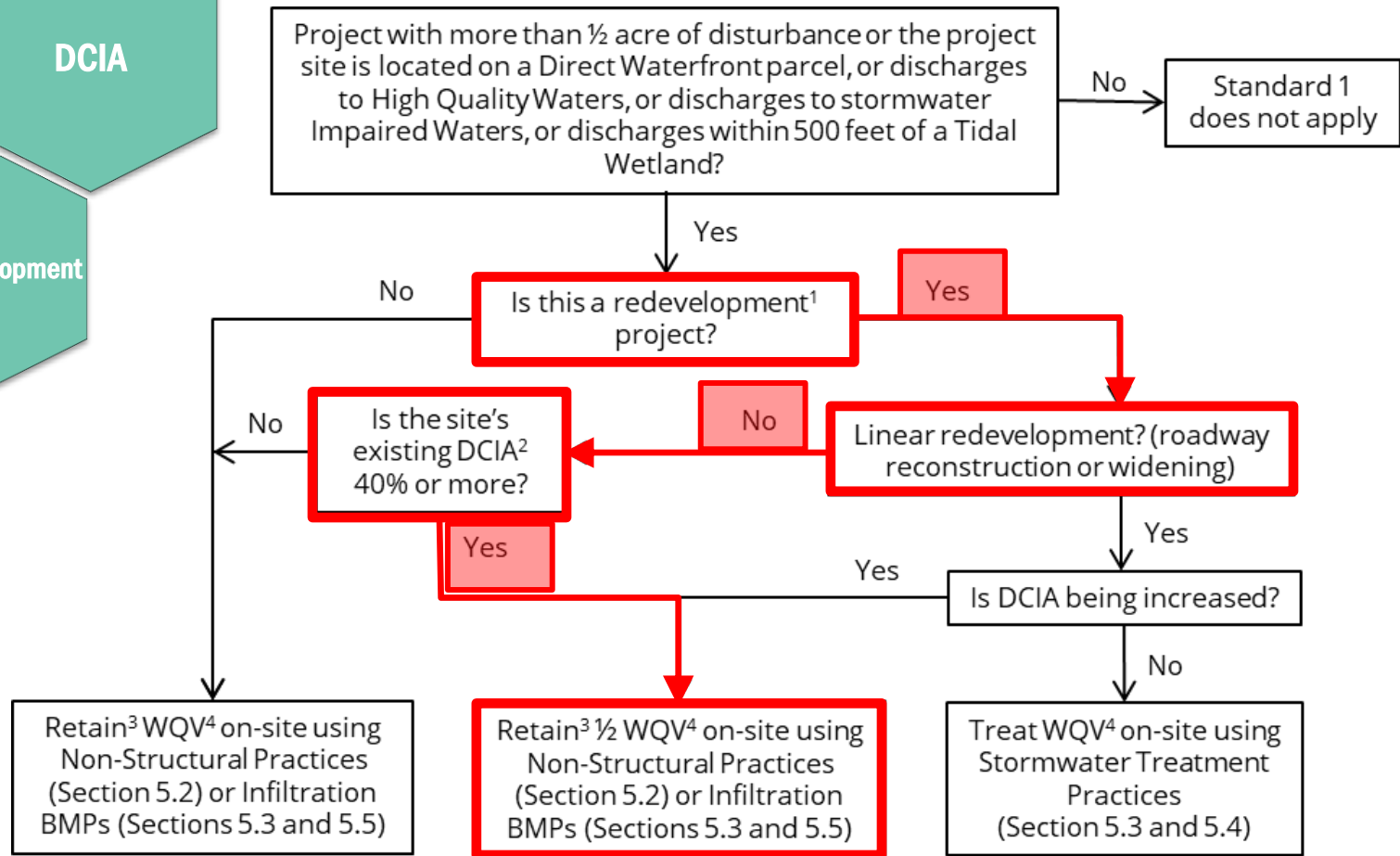
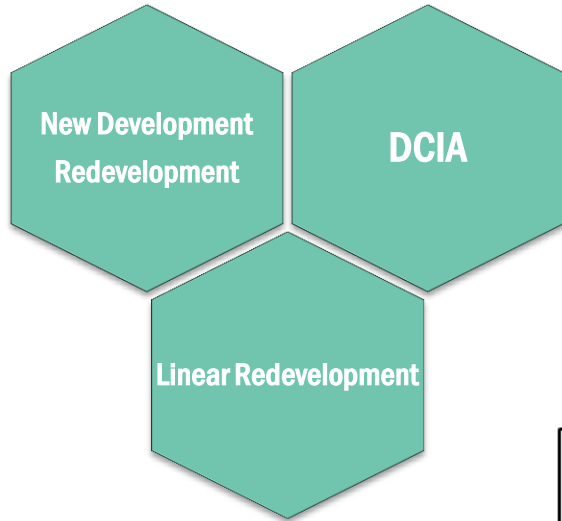
Project 2 – Mixed Use Redevelopment



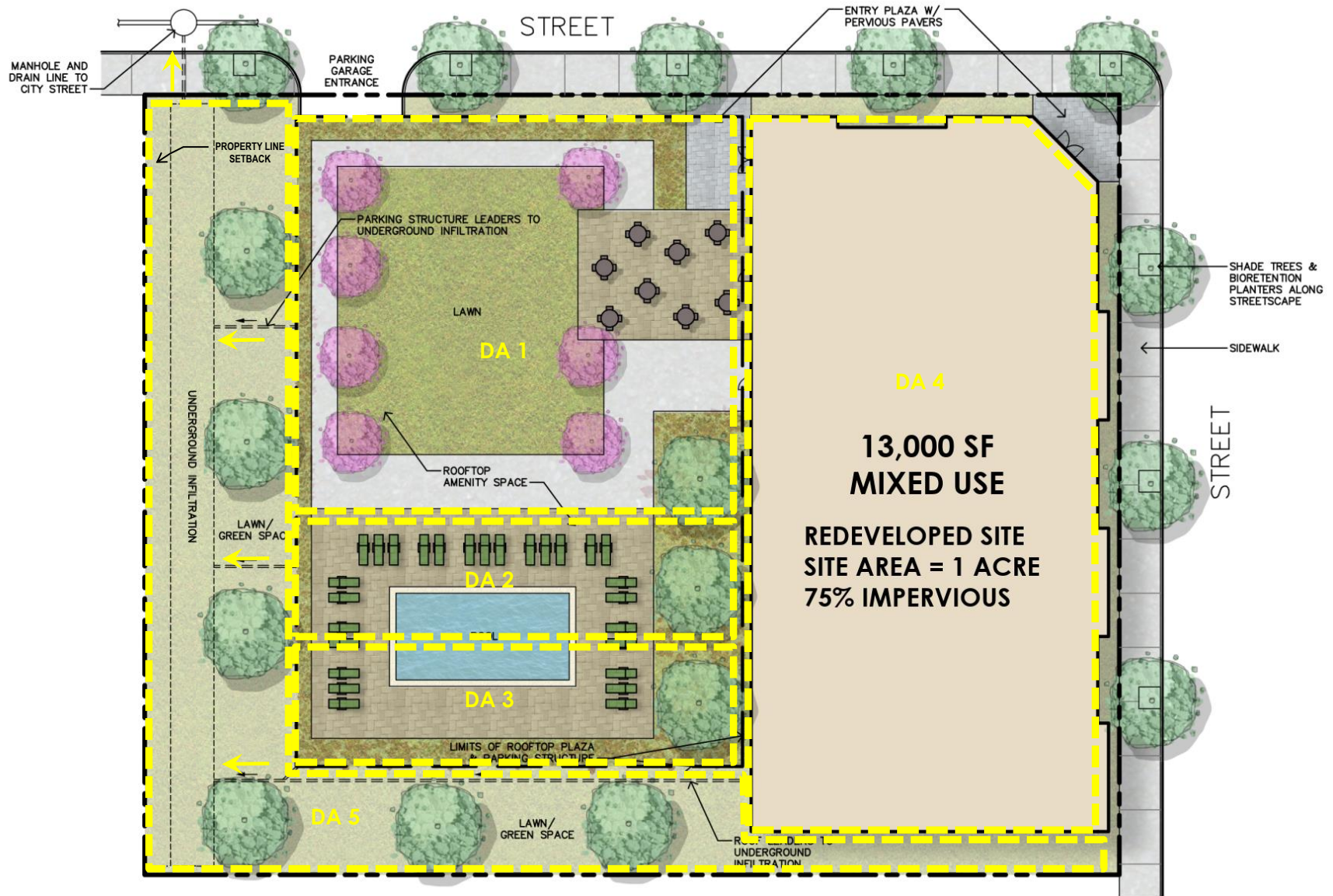
Project 2 – Standards Applicability Flowchart



Project 2 – Standard 1 Flowchart



Project 2 – Proposed Stormwater Management



Project 2 – Retention & Treatment Calculations

- Redevelopment, DCIA > 40%
- Retain ½ WQV on-site

Standard 1 (Retention and Treatment) Calculations

Drainage Area ID	Drainage Area and BMP Description	Total Area (SF)	Total Area (Acres)	% Impervious	Impervious Area (SF)	Runoff Coefficient R	WQV (Acre-Feet)	WQV (CF)	Retention Volume Required (CF)	Retention Volume Provided (CF)
Design Point - Drain Manhole in Street										
1	Rooftop Lawn Area - Underground Infiltration	11,000	0.253	100%	11,000	0.950	0.0200	871	435	
2	Rooftop Pool Area - Underground Infiltration	4,300	0.099	100%	4,300	0.950	0.0078	340	170	
3	Rooftop Pool Area - Underground Infiltration	4,200	0.096	100%	4,200	0.950	0.0076	333	166	
4	Building Roof - Underground Infiltration	13,000	0.298	100%	13,000	0.950	0.0236	1,029	515	
5	Lawn Area/Green Space	11,000	0.253	0%	0	0.050	0.0011	46	23	
Site Totals		43,500	0.999	75%	32,500		0.0601	2,619	1,309	1,400

Project 2 – DCIA Tracking Worksheet

- **Redevelopment**
- **1-acre reduction in DCIA (pre- vs. post-development)**

Part 2: Project Details		
1. What type of development is this? (choose from dropdown)	Redevelopment	
2. What is the total area of the project site?	43,500	ft ²
3. What is the total area of land disturbance for this project?	43,500	ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
5. What is the <u>current</u> DCIA for the site?	43,500	ft ²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No)	No	
7. What is the <u>proposed-development</u> total impervious area for the site?	32,500	ft ²

Part 3: Water Quality Target Total		
Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	2,619	ft ³
Standard 1 requirement	Retain 1/2 WQV on-site	
Required retention volume	1,309	ft ³
Provided retention volume for proposed development	1,400	ft ³

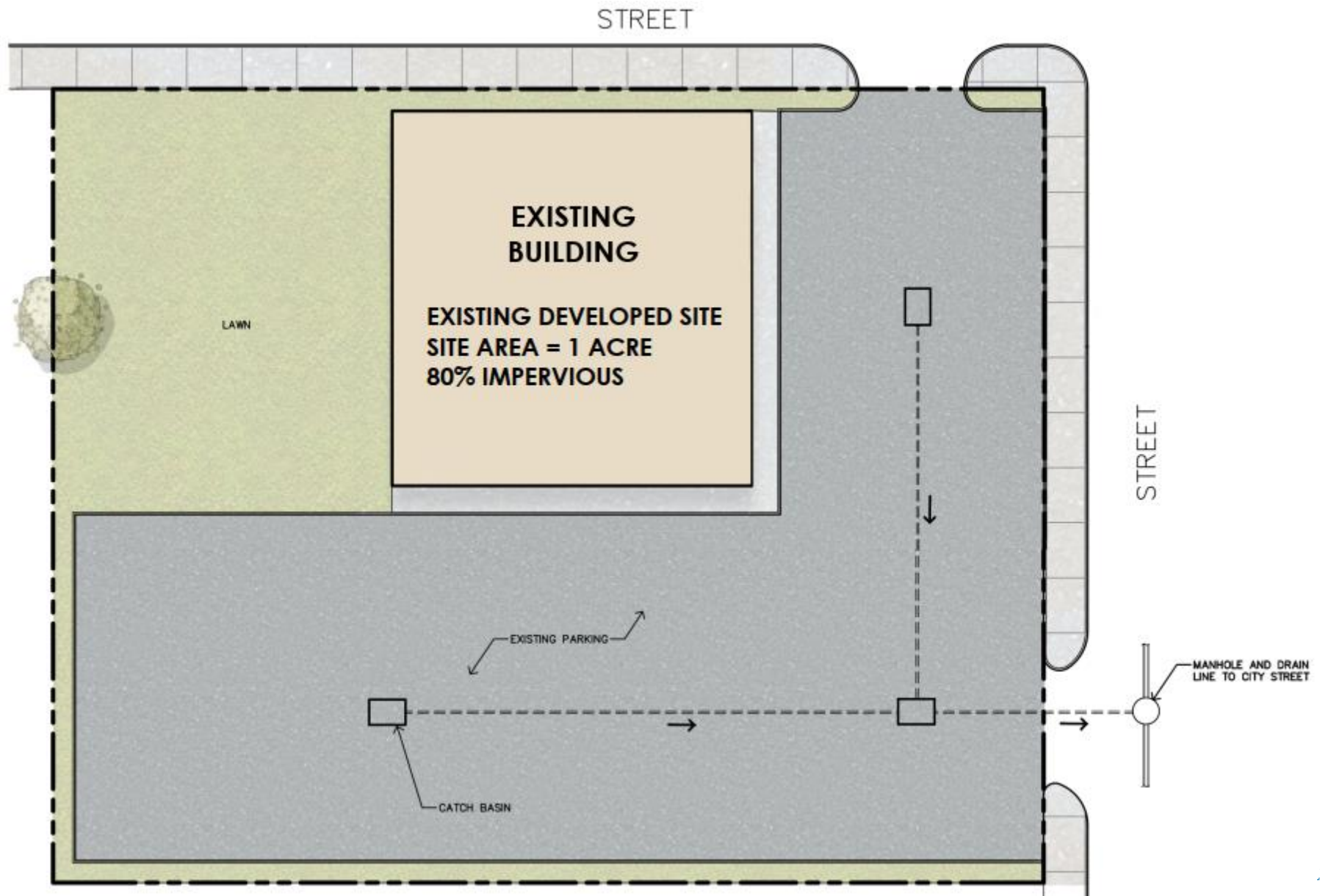
Part 4: Proposed DCIA Tracking		
<u>Pre-development</u> total impervious area	43,500	ft ²
<u>Current</u> DCIA	43,500	ft ²
<u>Proposed-development</u> total impervious area	32,500	ft ²
<u>Proposed-development</u> DCIA (after stormwater management)	0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>proposed-development</u>	-43,500	ft ²

Part 5: Post-Development (As-Built Certified) DCIA Tracking		
<u>Post-development</u> (per as-built) total impervious area	32,500	ft ²
<u>Post-development</u> (per as-built) DCIA (after stormwater management)	0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>post-development</u>	-43,500	ft ²

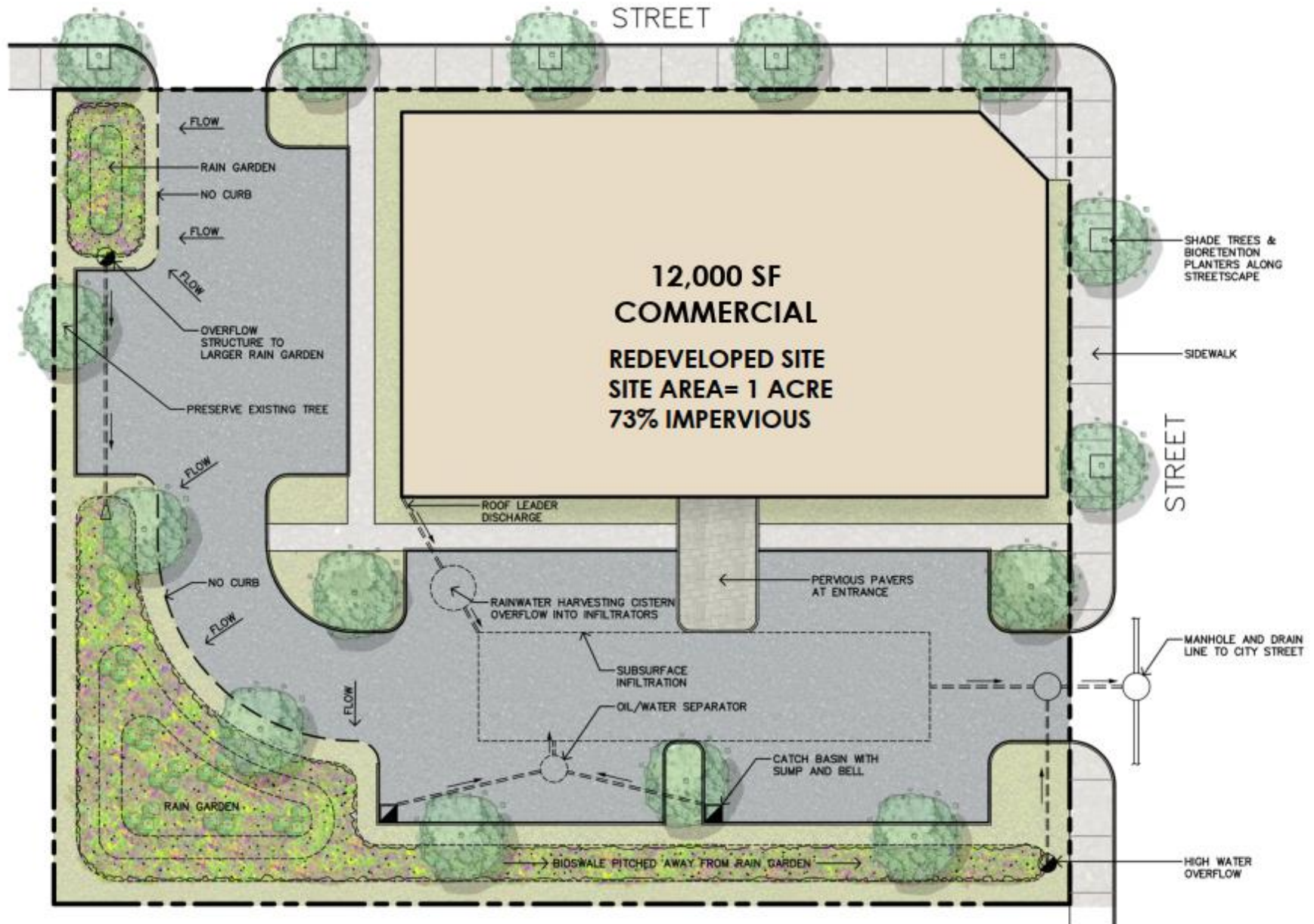
Project 2 – Submittal Requirements

- **“Full” Stormwater Management Report**
 - **Completed Checklists**
 - **Stormwater Management Report**
 - **Supporting Calculations**
 - **Supporting Mapping**
 - **DCIA Tracking Worksheet**
 - **Post LID Review Map**
 - **Erosion and sediment control plan**
 - **Supporting documentation (Section 6.3)**

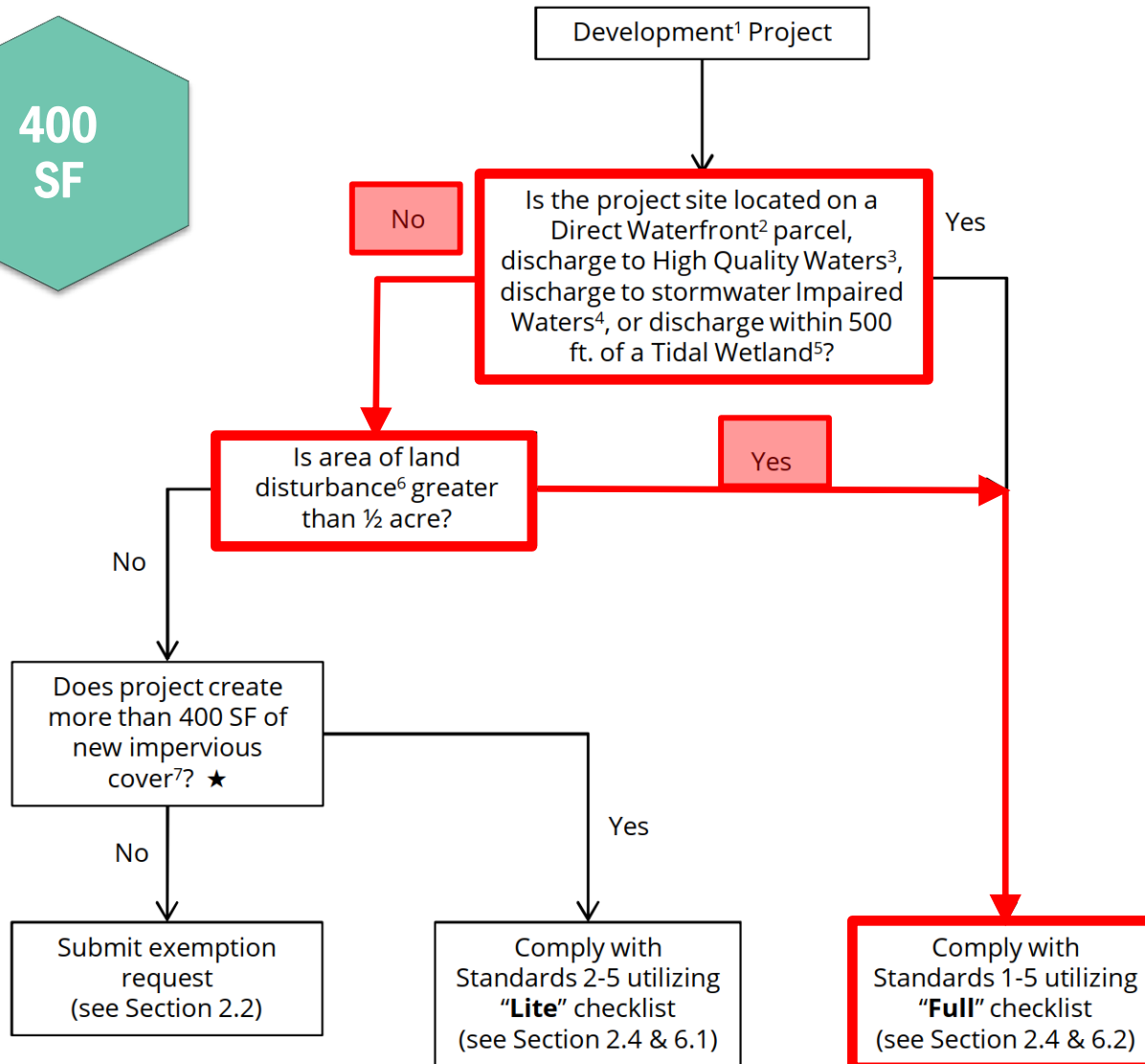
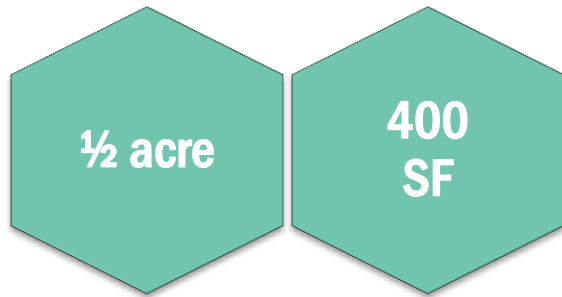
Project 3 – Commercial Redevelopment



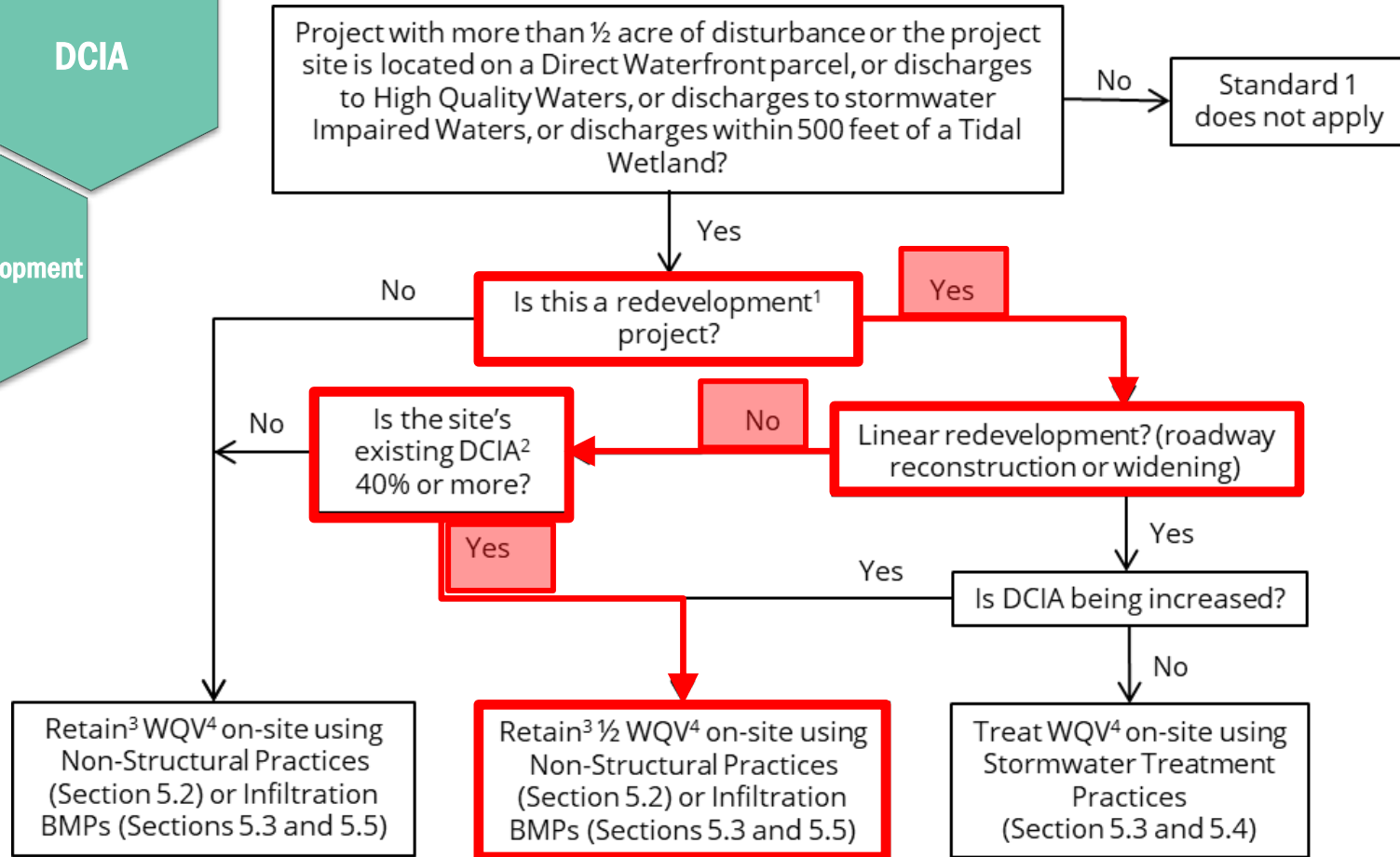
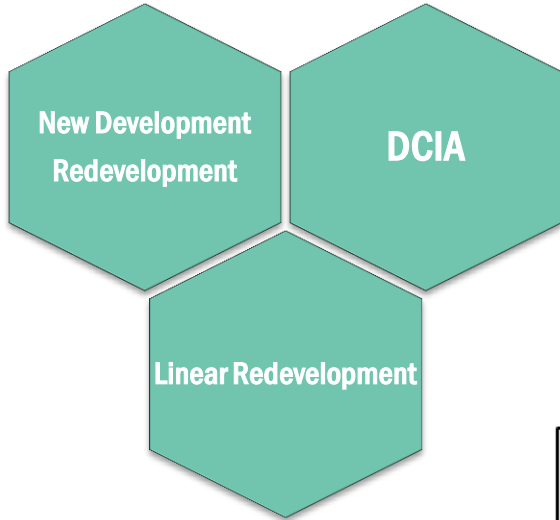
Project 3 – Commercial Redevelopment



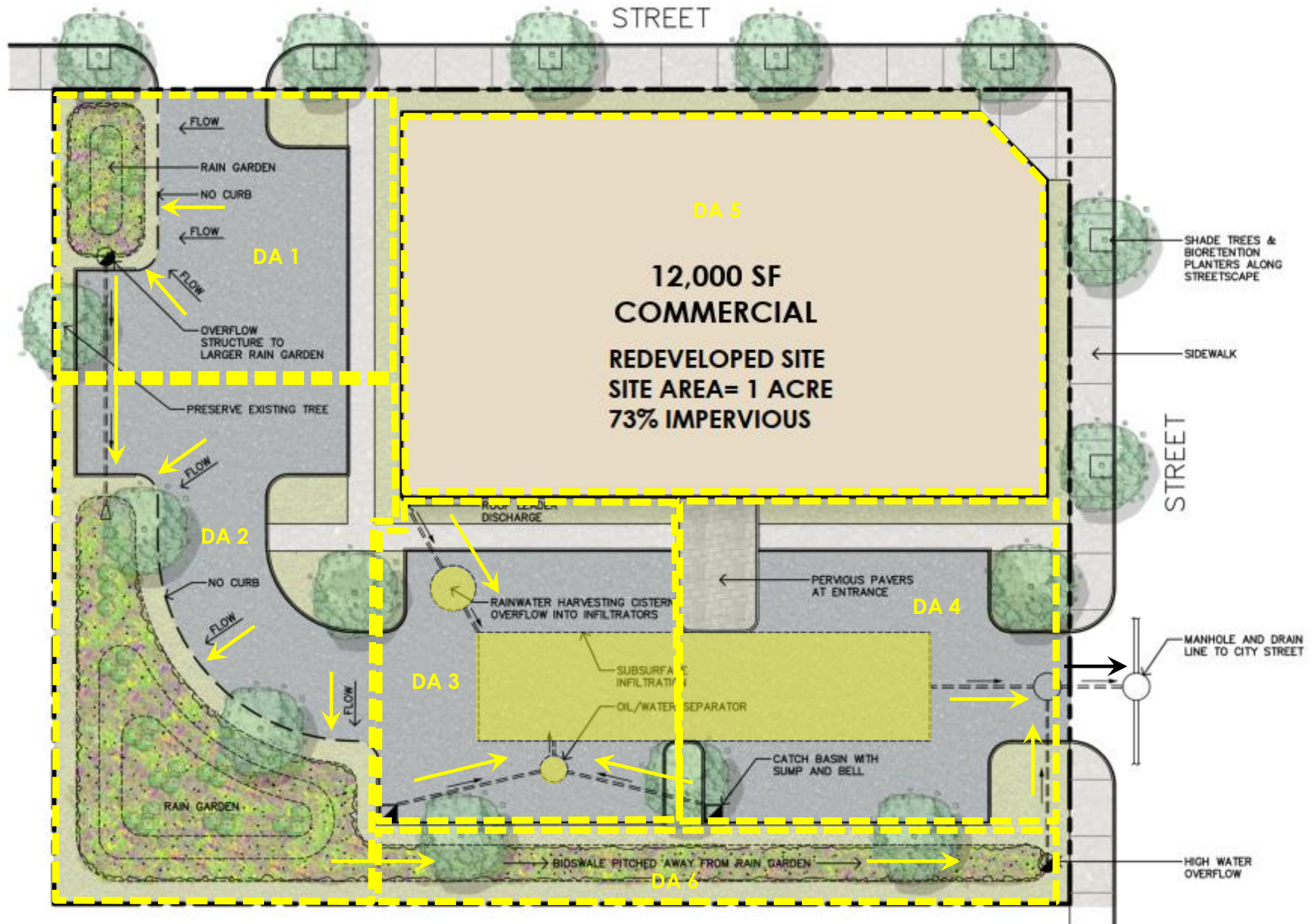
Project 3 – Standards Applicability Flowchart



Project 3 – Standard 1 Flowchart



Project 3 – Proposed Stormwater Management



Project 3 – Retention & Treatment Calculations

- Redevelopment, DCIA > 40%
- Retain ½ WQV on-site

Standard 1 (Retention and Treatment) Calculations										
Drainage Area	Drainage Area and BMP Description	Total Area	Total Area	% Impervious	Impervious Area	Runoff Coefficient R	WQV	WQV	Retention Volume Required	Retention Volume Provided
ID		(SF)	(Acres)		(SF)		(Acre-Feet)	(CF)	(CF)	(CF)
Design Point - Drain Manhole in Street										
1	Parking - Northwest Rain Garden	5,000	0.115	75%	3,750	0.725	0.0069	302	151	460
2	Parking - Southwest Rain Garden	8,000	0.184	65%	5,200	0.635	0.0097	423	212	1,800
3	Parking - Underground Infiltration	5,500	0.126	100%	5,500	0.950	0.0100	435	218	320
4	Parking - Underground Infiltration	5,500	0.126	100%	5,500	0.950	0.0100	435	218	320
5	Building Roof - Underground Infiltration	12,000	0.275	100%	12,000	0.950	0.0218	950	475	640
6	Lawn Area/Bioswale	7,500	0.172	0%	0	0.050	0.0007	31	16	0
Site Totals		43,500	0.999	73%	31,950		0.0592	2,578	1,289	3,540

Project 3 – DCIA Tracking Worksheet

- **Redevelopment**
- **0.8-acre reduction in DCIA (pre- vs. post-development)**

Part 2: Project Details		
1. What type of development is this? (choose from dropdown)	Redevelopment	
2. What is the total area of the project site?	43,500	ft ²
3. What is the total area of land disturbance for this project?	43,500	ft ²
4. Does project site drain to High Quality Waters, a Direct Waterfront, or within 500 ft. of Tidal Wetlands? (Yes/No)	No	
5. What is the <u>current</u> DCIA for the site?	34,800	ft ²
6. Will the proposed development increase DCIA (without consideration of proposed stormwater management)? (Yes/No)	No	
7. What is the <u>proposed-development</u> total impervious area for the site?	31,950	ft ²

Part 3: Water Quality Target Total		
Does Standard 1 apply based on information above?	Yes	
Water Quality Volume (WQV)	2,578	ft ³
Standard 1 requirement	Retain 1/2 WQV on-site	
Required retention volume	1,289	ft ³
Provided retention volume for proposed development	3,540	ft ³

Part 4: Proposed DCIA Tracking		
<u>Pre-development</u> total impervious area	31,950	ft ²
<u>Current</u> DCIA	34,800	ft ²
<u>Proposed-development</u> total impervious area	31,950	ft ²
<u>Proposed-development</u> DCIA (after stormwater management)	0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>proposed-development</u>	-34,800	ft ²

Part 5: Post-Development (As-Built Certified) DCIA Tracking		
<u>Post-development</u> (per as-built) total impervious area	31,950	ft ²
<u>Post-development</u> (per as-built) DCIA (after stormwater management)	0	ft ²
Net change in DCIA from <u>pre-development</u> to <u>post-development</u>	-34,800	ft ²

Project 3 – Submittal Requirements

- **“Full” Stormwater Management Report**
 - **Completed Checklists**
 - **Stormwater Management Report**
 - **Supporting Calculations**
 - **Supporting Mapping**
 - **DCIA Tracking Worksheet**
 - **Post LID Review Map**
 - **Erosion and sediment control plan**
 - **Supporting documentation (Section 6.3)**

Required Submittals – Certificate of Occupancy

- **Final Improvement Location Survey**
- **PE Signed and Stamped Certification Form**
- **PE Signed and Certified DCIA Tracking Worksheet**
- **Drainage Maintenance Agreement**
- **Other certifications as requested by Engineering Bureau**
 - **Wall Certification**
 - **Landscape Certification**
 - **Landscape Maintenance Agreement**
 - **Waiver Covering Storm Sewer Connection**
 - **Waiver Covering Granite Block, Depressed Curb, & Driveway Aprons**
 - **Flood Certification**
- **Final Inspection/Signoff by Stamford Engineering Bureau**

Questions and Comments

