SINGAPORE
TECHNICAL ADVISORY FOR REAL ESTATE TRANSACTIONS
ABOUT US

The impact of climate change, digital disruption and urbanization requires businesses to consistently evolve. Whether it’s strategic technical advice, organizational transformation, maximizing investment return or enhancing asset performance, clients require customized and strategic solutions to ensure they can deliver their desired business outcomes.

BUSINESS ADVISORY

Our approach to business advisory focuses on developing a thorough understanding of our clients’ needs and then designing and implementing solutions that deliver tangible value to their organizations. Our core advisory services can be divided into three areas: Technical Investment Risk Management, Asset Performance Optimization and Strategic Consulting.

TECHNICAL INVESTMENT RISK MANAGEMENT

Whether acquiring or disposing of an asset, providing development debt or equity, or investing into a security, we provide holistic, outcome focused advice to ensure technical risks are known and appropriately managed prior to the commitment of funds.

ASSET PERFORMANCE OPTIMIZATION

We advise clients on how to optimize the economic, social and environmental costs of their assets and ensure their portfolio is fully aligned to their overall business strategy.

STRATEGIC CONSULTING

Our Business Advisory consultants provide a wide range of strategic advice to our clients through discreet, one-off, tailored solutions including market entry strategies, workforce analytics, product performance benchmarking, feasibility studies and predictive urban planning.

Through our sector expertise, technical insight, local understanding and international experience, we have a deep track record in identifying opportunities to help clients gain the maximum benefits from their investments.
TEAM EXPERIENCE AND CAPABILITY

In the role of a technical advisor, Arcadis has positively contributed to Clients’ decisions in their commercial negotiations for both greenfield and brownfield investments, providing a solid basis for price negotiations and allocation of risks for the transactions.

Arcadis has vast experience in advising the investors with the negotiation through their deals and completed more than 20 million sqft of assets from 2017 to 2019.

Supported clients from the technical and operational perspective in various asset classes ranging from commercial, retail, hospitality, industrial, logistics, residential, heritage buildings to theme parks and port infrastructure.

We pride ourselves on being the market leaders, delivering desired results in technical due diligence works for numerous investors and vendors locally and in the region.

During which, areas of risk are identified along with mitigation strategy to assist clients with their commercial negotiations and strategic planning for the asset or portfolio.

Arcadis has an international team dedicated to due diligence and transaction advisory services

Figure 1: Distribution of Asset Classes which Arcadis has supported investors through technical advisory over the last 3 years
This graphic demonstrates our delivery of exceptional and sustainable outcomes for our clients’ natural and built assets.

**Technical Investment Risk Assessment**

- Pre-investment Technical Due Diligence
- Project Monitoring

**Asset Performance Optimisation**

- Life Cycle Cost Assessment
- Feasibility Studies for Asset Enhancement Initiatives

**Strategic Consulting**

- Cost Benefit Studies
- Market Entry Strategies
- Performance Benchmarking
- Workforce Analytics
- Smart City Research & Strategy
- Predictive Urban Planning
Whether you are a Private Equity (PE) firm, investment bank, sovereign wealth fund or developer company investing in greenfield or brownfield, technical due diligence is an important component of the investment cycle. Prior to venturing into any deals, it is crucial to understand the salient issues surrounding real estate developments from a technical standpoint which very often may not be considered as a priority at the outset of the deals for most investors.)
We have experience in advising on a diverse range of asset classes through the following services:

1. **PRE-INVESTMENT TECHNICAL DUE DILIGENCE**
   Review building fabric and documentation to identify any key architectural, MEP installations and statutory risks prior to our client’s investment or divestment plan.

2. **PROJECT MONITORING**
   Monitor the baseline project programme and report against project key stages. We put in place monitoring processes to provide early insights on risk, with early identification and development of mitigation measures to protect our clients’ investment after signing SPA.

3. **PROJECT AUDITS**
   Appraise the project development by reviewing project documents including development agreement, Project Execution Plan, Master Programme, Procurement & Contract Documentation, Project Control processes, Cost and Budget Control processes, drawing upon attention to the critical issues and recommended course of actions.

4. **INDEPENDENT TESTER**
   Ensure compliance with Project Agreement and highlighting any deficiencies, making sure smooth and timely progress of works. (Sports Hub Case Study.)
1. PRE-INVESTMENT TECHNICAL DUE DILIGENCE

Majority of Arcadis Business Advisory’s clients are institutional investors who manage a large portfolio of property assets on behalf of their beneficial owners or stakeholders. Arcadis’ advisory role in a transaction could be representing party either in the acquisition or disposal of assets.

Investor’s or purchaser’s technical due diligence

Our key objectives are to understand the asset performance, identify significant capital expenditures and any statutory non-compliances. We helped clients understand the risks, mitigating their impacts prior to entering a legal commitment. The capex estimates we provided associated with the defect rectification works and replacement costs for end of life components also contributed to the rationalization of the acquisition terms between seller and the buyer.

With the improved certainty of returns in asset, investors can make informed decisions as they are assured and aware of the quality, conditions and any associated liabilities.

Vendor’s technical due diligence

Where Arcadis represent the seller, we seek to identify risks early and addressing them prior to the commencement of the transaction period, expediting the transaction process as our reports are made available to prospective buyers.

Undertaken ahead of a valuation, our reviews also provide an alternate opinion on the value of the property having regard to its existing condition and remaining life expectancy of key elements, taking into consideration any physical deterioration, functional and economic obsolescence in lieu of a straight-line depreciation assessment.
A More Focused Need

From pre-investment through to project planning, construction, and operation stages, we helped our clients understand the associated technical risks, future costs and other liabilities.

More investors have shifted their focus on pertinent technical risks relating to the physical state of the assets and the asset performance in longer term.

Traditionally, investors, largely local investor community typically engage multi-disciplinary consultants with Qualified Persons (QPs) to conduct detailed assessments on the condition including design of the property from the aspects of architecture, structure and building systems installations, ensuring that the assets comply with the current local design codes. Such assessments akin to undertaking a re-engineering process of the building design are not only too exhaustive and time-consuming but also costly.

Buildings are deemed in compliance with the design code at completion upon receipt of the relevant approvals. As compliance of the latest design code will most often be triggered if major Asset Enhancement Initiatives (AEI) works were to be carried out, deep dive review on the base building design may not be needed especially if the investors have short investment window.

To provide clients with a holistic assessment in any investment or divestment transactions, we review on the completeness of documentation, building condition, maintenance approach, robustness of capital expenditures planning in short, mid & long-term basis and efficiency of operation expenses. Further investigations or tests by specialists will only be called upon in any obvious design codes breaches observed during visual inspection. This offers not only a more cost-effective approach of assessing the asset condition but also significantly reduce the survey time during the short transaction period.

There is rising demand from investors on the above assessment approach as evidenced by an increased number of due diligence works carried out in Year 2019 – an increase of 50% from the previous year.

Our Approach

On both individual properties and portfolios, we offer a range of report types to suit the speed of the transaction and the size and complexity of the building or portfolio. We engage with Clients prior to instruction to tailor our advice to precise requirements and to ensure the correct commercial focus.

We frequently review technical due diligence reports prepared by others, where these are to be assigned, to confirm suitability, identify where advice may be lacking and offer additional advice where required.
A More Focused Need

**The Outcome Delivered**
The identification of risk allows the investor to make informed decisions as to whether to proceed with the funding. We use a rigorous and comprehensive approach to risk identification and mitigation enabling the risks to be understood, their impact to be mitigated and provide increased certainty for the Client to achieve their desired outcome.

In providing certainty over project outcomes our proposition is to:

- Provide a tailored approach to meet precise requirements depending on the nature of the deal
- Provide a range of survey and reporting options
- Liaise with all relevant parties to provide comprehensive and conclusive advice
- Use specialist sector knowledge and experience to give informed insight and opinion.
A More Focused Need

Our focal points

• Determine the existing building condition

• Whether significant capital expenditures relating to defects or end of life components exist in the structure, fabric and building services installations

• If there are non-compliance implications in respects of operation and unauthorized installations /alteration works against approved plans

• If the mandatory permits or licenses are in place

• An indicative list of items that potentially need to be upgraded to meet the current design code

• Deep dive design review on the base build to be undertaken with an impending Asset Enhancement Initiatives (AEI) plan

• When required, we carry out Life Cycle Cost Analysis (LCCA) through the development of a strategic CAPEX plan on an extended term, taking into consideration operation expenditures including future periodic maintenance and rehabilitation. The costs presented are discounted and computed to a present-day value known as Net Present Value (NPV).

We helped investors understand the key risks and supported them through the completion of their deals:

Documentation risk:

• Missing approvals, permits or licenses that are mandatory by local authorities
• Non-compliances relating to approved GFA
• Incomplete key documents and approved drawings

Building fabric risk:

• Non-compliance with the local design codes
• Unauthorized installations /alteration works
• Unauthorized use of approved premises
• Encroachment and TOL related issues

MEP installation risk:

• Non-compliance with the local design codes
• Non-compliance implications in respects of operation and unauthorized installations /alteration works

Operation and Maintenance risk:

• Risks associated with high replacement costs in absence of a routine preventative maintenance regime.
• Health and safety implications in respects of operation and management of property

A TDD is often accompanied by an EDD to show potential risks of contamination at the site, which includes the review of hazardous substances management, wastewater treatment, waste management and water supply. As part of an Environmental Social Governance (ESG) Due Diligence, we also review the sustainable initiatives and provide recommendations on opportunities to improve the overall management around energy and water consumption, waste management, stakeholder management amongst others.
Environmental, Social and governance

As an integral part of the due diligence process, Arcadis enables clients to understand and assess environmental liabilities of assets and the management practices associated with these. An understanding of these environmental liabilities will help clients negotiate terms on mitigation, but more importantly, these insights will help the client gain an edge on finding ways to positively intervene and develop future assets in a sustainable manner.

Identifying (potential) contamination through Environmental Due Diligence

Whether during an acquisition or divestment of assets it is important to identify potential sources of contamination. This can be achieved through Environmental Due Diligence (EDD) or Phase 1 Environmental Site Assessment (ESA). These assessments will highlight the most likely factors that could have caused or might cause future contamination at the site and surrounding area. Topics that are covered involve historical land use, chemical management, waste management (including wastewater) and water supply amongst others. The assessment focuses on the physical infrastructure that is involved in the management of environmental factors and could be a potential contamination source. Recommendations and capital investment necessary to reduce contamination risk or clean a potential contamination are provided as outcome of the assessment.

If necessary, Arcadis will be able to support you in finding the extent of the contamination through a Phase II ESA/Environmental Baseline Study (EBS) and plan for remedial action accordingly, to restore the site within acceptable environmental limits.

Improving management practices with Environmental, Social and Governance Due Diligence

A more comprehensive assessment of assets, including both social and governance factors besides the generic EDD is an Environmental, Social and Governance (ESG) Due Diligence. This type of assessments are becoming the norm as frameworks and organisations such as the Principles for Responsible Investment (PRI) and the Task Force on Climate Related Financial Disclosures (TCFD) require investors and asset manager to disclose more information on their portfolios, which also requires more data collection than before.

In comparison to a normal EDD, an ESG DD assesses more factors, including resource efficiency (energy, water), climate change adaptation, health and safety, labour and working conditions, discrimination, bribery and corruption and stakeholder engagement. The assessment will go into more depth on the management system implemented at the asset and provides recommendations on how to improve practices to an acceptable level and increase the potential for positive outcomes. You are not simply basing your investment decision on appropriate infrastructure in the asset, but also requiring the tenant/property manager to ensure practices in use are compliant and do not give rise to the potential for the asset to be devalued in the future.
Environmental, Social and governance

And if uncertainty remains...

There is the possibility that a specific issue identified might require in-depth analysis as uncertainties arose that could not be resolved during the due diligence process. These instances require a more detailed assessment. Given the anticipated climate change related impacts on cities a potential issue is the resiliency of the asset to future flood risk. The majority of economic centres are located on the coast, or in river deltas, where flood risk tends to be higher. Arcadis supports their clients in tailored assessments like these and in relation to many other ESG factors and future climate change risk, to make informed investment and portfolio asset management decisions.
As an added service, Arcadis leverage on drone technology to inspect facades or roofs. Our in-house developed software enables the automation of detecting defects at these inaccessible locations.

Arcadis’ drone and data optimization capabilities enables automation of identifying defects and deformations. It delivers to clients an increased accuracy and productivity in reporting and analysis of a building condition and enables them to prioritise rectification works. Combining our industry expertise, state-of-the-art equipment and software, and CAAS certified drone pilots, we can identify areas with surface and sub-surface defects such as cracks, spalling, stains, water leakages.

The assessment allows for our clients to conduct further testing depending on the severity.

**Benefits**

- Removes requirement for rope or scaffolding inspections
- Quick and accurate data turnaround
- Reduced safety risks
- Significant time and cost savings
2. PROJECT MONITORING & AUDITS

By and large, an investor’s or lender’s approach in engaging a technical advisor will vary depending on their business strategy, organization risk management processes and nature of the transaction. Through our combined technical, consulting and management skills, we can deliver exceptional outcomes for clients across all phases of assets.

Our experienced Business Advisory consultants understand clients’ needs in different investment routes.
Forward purchase, forward funding or joint venture approach

We understand the various exposures in the different investment structures, thus able to provide advice to clients to ensure that their decisions are fully informed and technical risks are understood. Early involvement in the due diligence process helps lenders or investors draw up favourable head of terms with their partners which very often should be dynamic, providing for recourse mechanism and safeguarding the investors’ interests in unforeseeable events. The project should be monitored throughout the project duration to ensure that the highlighted risks are appropriately checked and managed.

**Forward purchase**

In this structure, investors have less control on the development phase and the purchase price will only be paid in full upon completion of the development. Hence, posing high risk of an inferior product delivered by the seller who could be crushing the project for an earlier completion. It would therefore be a high priority focus for Arcadis to formulate sound governance procedural processes during project monitoring stage to assist investors in mitigating the associated risks.

**Joint venture**

A desirable option for investors who prefer more involvement in development phase and have bigger risk appetite sharing ownership, governance and development risks. In this arrangement, high-level assumptions were normally adopted at initial or land bidding stage and investors or lenders having low visibility on actual proposed asset mix and design as both parties only agree on land price and indicative asset mix. Our reviews include product specifications, design considerations, cost estimates and comparing against its comparable, taking into consideration that they are well future proofed as well as allowing flexibility to respond to the market demand and supply conditions.

**Forward funding**

In an arrangement where investors pay in installments depending on the construction progress, validation of project performance, spend forecasts and variance is critical for the investors. We supported clients in tracking performance with the development of appropriate monitoring tools ensuring that the specific requirements are fulfilled throughout the development phase for the various purchase price instalments to be verified.
Project Audit or Monitoring is Indispensable for Project Success

Arcadis have successfully implemented best practices for a good project monitoring & controlling processes, tracking deviations from the expected results which helps to produce desired outcomes in a project; safeguarding the shared goal of delivering a successful project for both the investors and their JV partners.

Depending on the status of the transaction, a robust due diligence process will be implemented through desktop studies and regular site observations including:

<table>
<thead>
<tr>
<th>Development Documents</th>
<th>Compliance</th>
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<tbody>
<tr>
<td>Review the project documents including development agreements and conditions of contract</td>
<td>Compliance of the general contractor contract especially relating to the scope of work, quality controls and liabilities</td>
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<table>
<thead>
<tr>
<th>Project Execution Plan (PEP)</th>
<th>Procurement &amp; Contracts Administration</th>
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<tr>
<td>Understand the level of detail of the PEP including its sub-plans (risk management plans, quality management plan, resources management plan, cost management plan, etc)</td>
<td>Review the selection of appropriate procurement route, contract agreement, contract documentation, design &amp; drawings management</td>
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<tr>
<th>Contractor</th>
<th>Monitor &amp; Track</th>
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<tbody>
<tr>
<td>Understand the solvency of the general contractor</td>
<td>Monitor and review the baseline programme against actual site progress and key milestones in the status programme</td>
</tr>
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</table>
Positive outcomes achieved include:

- Highlighted associated risks / concerns on the selected draft contract agreement and recommended additional obligations to be included in the Contract as mitigation measures.

- Drawing attention to the inadequacy of master programme and the importance of developing a consolidated programme incorporated with sub-programmes and critical paths, to ensure projects are delivered with minimal risk.

- Recommended appropriate document control systems and processes to ensure processes are streamlined and no delay in the distribution of document.

- Recommended appropriate project control processes, ensuring the appropriate plans (clearly defined Project Execution Plan which in turn becomes a live document) are developed to track/improve project performance.

- Set out clear cost and budget control processes to better manage cost approval processes.

- Put in place a bespoke system to provide early insights on development risk with early identification and development of mitigation measures.

“We will challenge and test what is being proposed and reported by the project team”
3. INDEPENDENT TESTER

Combining our global connections with local knowledge and practical experience, we successfully completed Singapore Sports Hub, adding to our iconic infrastructure portfolio.

Harnessing our global knowledge of privately financed public ventures, Arcadis was able to define and execute compliance procedures which demonstrated international best practice, over and above the minimum standards outlined in the contract.

With multiple parties involved, each with different drivers and objectives, Arcadis’ role as Independent Tester has completed the high-profile national construction project, Singapore Sports Hub. Our principal role was ensuring the construction was undertaken in accordance with the Project Agreement and our sensitivity to client expectations are key factors for the success of the project.
Positive outcomes achieved include:

- Established design compliance from project requirements to ensure that all of the procuring parties worked towards an identified common goal.

- Through providing practical and pragmatic advice to both public and private sector parties, issues could be addressed and resolved in a collaborative manner, pursuant to the ideology of the partnership contract, at the earliest possible stage.

- By proactively reviewing and reporting on the construction quality, compliance and programme, Arcadis provided the project stakeholders with an independent and consistent understanding of the project.

- Arcadis worked closely with the project engineers and subconsultants to ensure that the testing and commissioning process was undertaken in a structured and systematic manner, with outcomes achieved against pre-determined criteria.

- Well defined compliance procedures and managed the process through the success completion of project.
SINGAPORE TECHNICAL ADVISORY FOR REAL ESTATE TRANSACTIONS | CAPABILITY & EXPERIENCE

SINGAPORE TECHNICAL DUE DILIGENCE EXPERIENCE

- Capital Square
- Office building at Robinson Road
- POMO Mall
- Coating Plant in Pasir Gudang, Malaysia
- Portfolio of Industrial Assets
- REC Solar Manufacturing Facility
Grand Park Orchard Hotel

Westin Hotel

Portfolio of Country Clubs

Portfolio of commercial malls

Shipyard Facility at Subic Port, Philippines
As part of Arcadis’ digital transformation journey we recently launched Arcadis Gen.

Our customers want digital solutions that will optimize their businesses – for better performance, reliability and improved quality of life for everyone. And that’s what we do.

Bringing together deep asset knowledge from global design and consultancy firm, Arcadis, with digital expertise from legacy Arcadis companies SEAMS and EAMS Group, we’re here to positively disrupt the industry. And generate what’s next.

The world is changing. Fast. The potential of boundless data and transformative technologies brings countless challenges. Below are our suite of products:

**PLAN**
Optimize expenditure for sustainable returns. Asset investment planning and decision support analytics tools to help you make better informed, data-driven decisions.

**DELIVER**
Enhance the performance of your investment programs. Manage cost and risk for seamless delivery. Program management and cost control solutions that put you in complete control.

**OPERATE & MAINTAIN**
Enhance the performance of your investment programs. Manage cost and risk for seamless delivery. Program management and cost control solutions that put you in complete control.

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**Arcadis’ Digital Partners**
Digital technologies open new possibilities to serve our clients and are changing the way we work and providing opportunities for different business models.

We have a ready ecosystem of digital partners who are able to support CIC on our digital journey. Below are some of our partners that we have globally that can be leveraged for this Project:

<table>
<thead>
<tr>
<th>Partner</th>
<th>Highlight</th>
<th>Partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft</strong></td>
<td>Our core business enablement applications… full access to virtually most of O365 products. Extremely close working relationship, and we have regular meeting and also preview of new products</td>
<td>Enterprise Agreement</td>
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<tr>
<td><strong>Autodesk</strong></td>
<td>Close engagement with Autodesk; we have appointed vendor manager and dedicated team for each region. We have easy access to their support and also can reach out to the development team – this include BIM360</td>
<td>Enterprise Agreement</td>
</tr>
<tr>
<td><strong>esri</strong></td>
<td>International supplier of geographic information system (GIS) software, web GIS and geodatabase management applications – e.g. ArcGIS</td>
<td>Enterprise Agreement</td>
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<tr>
<td><strong>Oracle</strong></td>
<td>Primera P6</td>
<td>Discount Licensing</td>
</tr>
<tr>
<td><strong>Tableau</strong></td>
<td>Business Intelligence Reporting. The leading BI products in the BI reporting domain</td>
<td>Discount Licensing</td>
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<tr>
<td><strong>Adobe</strong></td>
<td>Full range of Adobe products</td>
<td>Enterprise Agreement</td>
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<tr>
<td><strong>Bentley</strong></td>
<td>CostX</td>
<td>Enterprise Agreement</td>
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<tr>
<td></td>
<td>Advanced photogrammetry software uses images to create professional orthomosaics, point clouds, models and more.</td>
<td>Discount Licensing</td>
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InvestSmart by Arcadis

... its a Transaction Enabler & Accelerator

Digital platform designed to speed-up deal flow and improve transaction management:

- Quicker, easier transactions saves valuable time
- Better control, so fewer problems & less risk
- Increased team effectiveness & deal capacity
- Helps improves investment decision-making

Supports the needs of Investment Managers and provides oversight for senior Executives.

- Portfolio Mgt
  - Portfolio, Asset, Class

- CapEx Requirement
  - Benchmarks, Valuation, Fire, Safety, Lifecycle & Risk Mitigation

- Due Diligence
  - Technical, Environmental, Legal, Tax and RCA

- Market & ROI Analysis
  - Benchmarks, OpEx, Yield, Sustainability & Divestment

Supports real estate clients through all stages of their asset investment journey
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